SEPTEMBER 9, 1933

Railway Age

FOUNDED IN 1856

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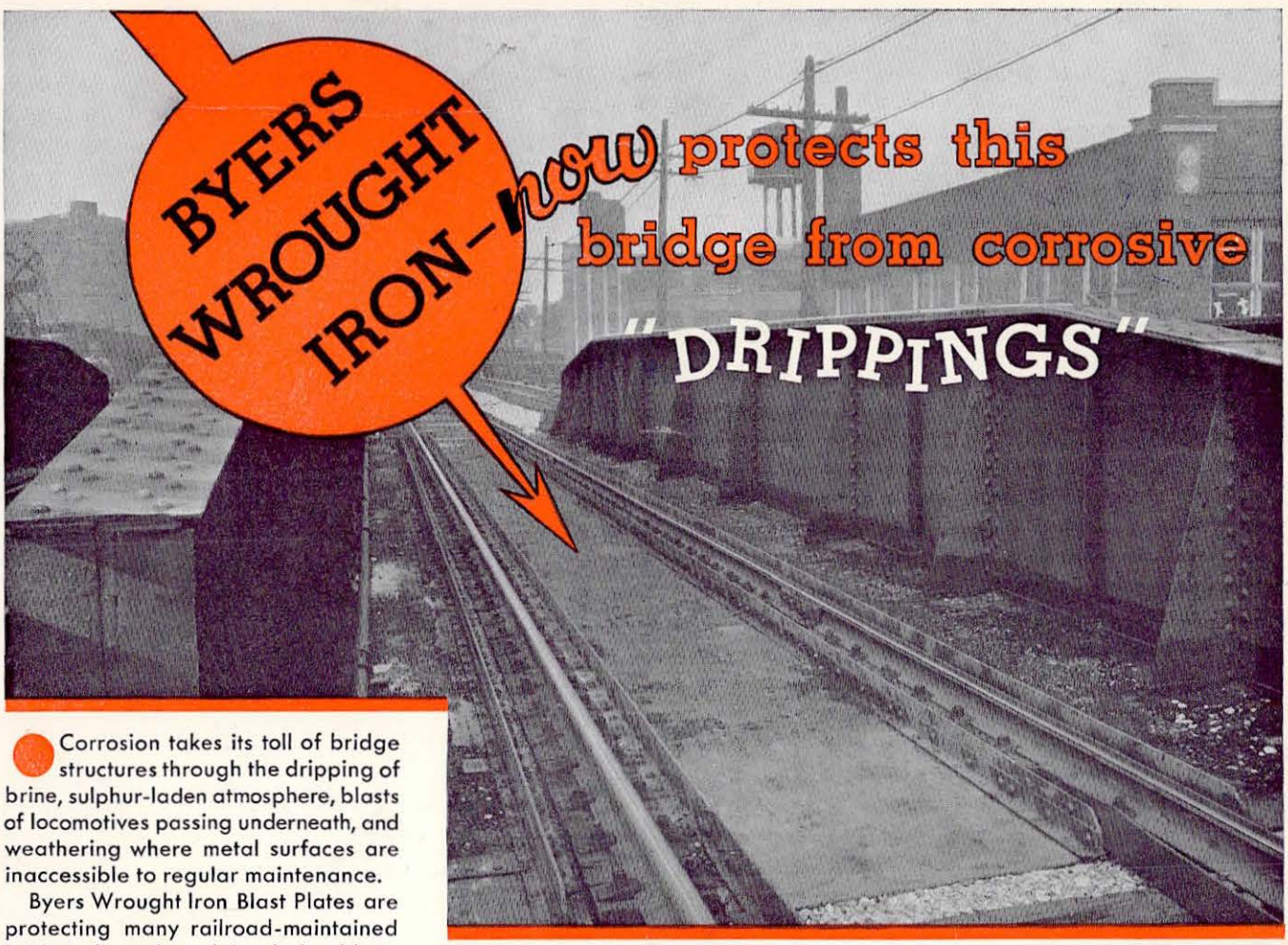
NRA WE DO OUR PART



Corrosion takes its toll of bridge structures through the dripping of brine, sulphur-laden atmosphere, blasts of locomotives passing underneath, and weathering where metal surfaces are inaccessible to regular maintenance.

Byers Wrought Iron Blast Plates are protecting many railroad-maintained bridges from the sulphur-laden blasts of locomotives passing underneath. This illustration shows how trough plates of Byers Wrought Iron are being used by a western railroad to drain off corrosive drippings.

The confidence with which railroad men have gone about using wrought iron plates and sheets, now that A. M. Byers Company have made them again available, is significant. Byers Wrought Iron, of course, has been a railroad standby for 69 years. Bridge engineers recognize the need of a more lasting material — one which has a proved record of long life with a minimum of attention. This record of long, faithful service under all kinds of corrosion has won for wrought iron a high regard among those responsible for selecting material.

Consequently, when Byers announced that wrought iron plates and sheets were again available, bridge engineers were quick to include it in their plans. Specifications calling for genuine wrought iron were written and wrought iron was put on the job as blast plates, cover plates, trough plates, water troughs and bridge railings.

For any information on wrought iron ask a Byers Engineer or write our Engineering Service Department. A. M. Byers Company, Established 1864. Pittsburgh, Boston, New York, Philadelphia, Washington, Chicago, St. Louis, Houston, Los Angeles.

BYERS GENUINE WROUGHT IRON PRODUCTS

PIPE · WELDING FITTINGS · RIVETS · SPECIAL BENDING PIPE · BAR IRON
PLATES · SHEETS · CULVERTS · FORGING BILLETS · STRUCTURALS

STANDARD of QUALITY for 69 YEARS · · · TODAY BETTER THAN EVER

1920

1932

TWELVE YEARS OF PROGRESS

Last week we illustrated a century of locomotive development.

The locomotives pictured above show the great progress made within the past twelve years.

The superiority of today's locomotives, as compared with those built in 1920, can be measured by the following typical characteristics —

	1920	*1932*
Steam temperature	*600°*	*700°*
Steam pressure {Lbs. per sq. in.}	*200*	*250*
Combustion rate {Lbs. of coal per sq. ft. of grate area per hour}	*120*	*100*
Steam consumption {Lbs. per I.H.P. hour}	*21*	*18*
Driving wheel diameter {freight locomotives}	*63″*	*70″*

The great boiler capacity, big driving wheels and fuel economy of the modern locomotive give ability to handle tonnage at speed and at a low operating cost per ton.

It takes Modern Locomotives to make money these days!

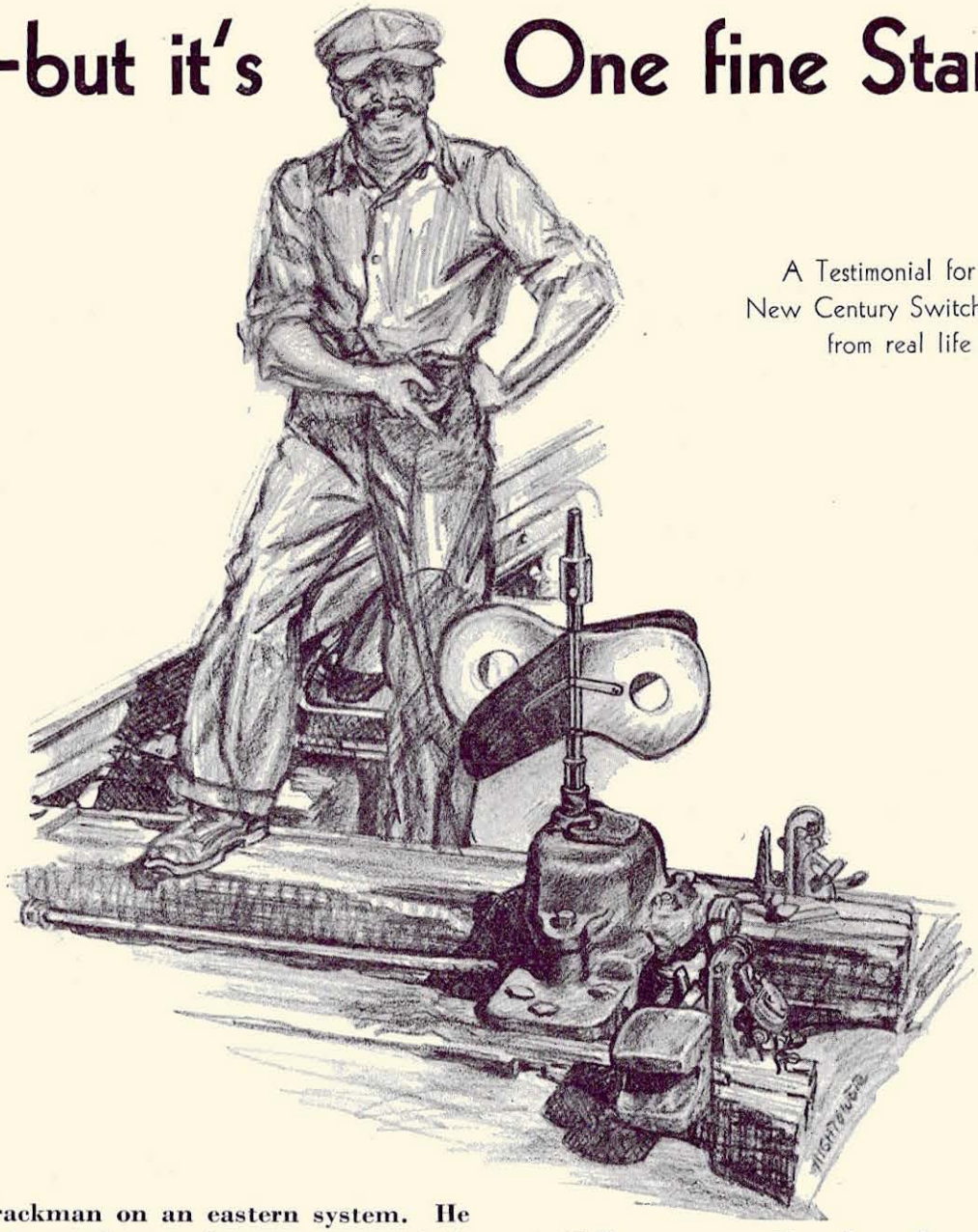
THE BALDWIN LOCOMOTIVE WORKS

PHILADELPHIA

Published weekly by Simmons-Boardman Publishing Company, 1309 Noble Street, Philadelphia, Pa. Entered as second class matter. January 4, 1933, at the Post Office at Philadelphia, Pa., under the act of March 3, 1879.

I don't know who make deesa Stand —but it's One fine Stand!

A Testimonial for the
New Century Switch Stand
from real life



HE'S a trackman on an eastern system. He knows switch stands as only a man can who's worked around them with his own two hands for 22 years. . . . He didn't know this stand by name, had no idea he was talking to a representative of the manufacturer.

He only knew what his years of experience had proved to him, that the New Century is a good switch stand. And he said so, without being asked. . . . "It turn easy . . . never get full water . . . never make trouble . . . one fine stand!"

What more could anyone ask? And, after all, who is a better-qualified judge of switch stands than the trackman?

He may not realize the refinements that go into the design of the New Century, or the care with which it is built of drop forgings and heat-treated alloys. But he sees the results—year after year of trouble-free service, with little attention and hardly any maintenance.

"One fine stand!"

Maintenance of way engineers without number feel the same way about the New Century Stand—and use it on their main-line track.

BETHLEHEM STEEL COMPANY
GENERAL OFFICES: BETHLEHEM, PA.

BETHLEHEM STEEL

NEW CENTURY SWITCH STAND

TWENTY YEARS PROGRESS

Through Oxweld Research and Development

•

Twenty years ago the oxy-acetylene process of welding and cutting metals was practically unknown on the railroads. Such apparatus as was in existence was of crude and cumbersome design. Problems of oxygen and acetylene production and distribution on a broad and economical basis were unsolved. Special welding rods for specific applications were unknown. Effective procedures in the application of the art of oxy-acetylene welding and cutting were non-existent.

The Oxweld Railroad Service Company pioneered the introduction and development of the autogenous welding and cutting processes on the railroads and during two decades has cooperated with the carriers in working out the innumerable problems the successful solution of which has led to substantial reduction in the cost of maintaining equipment and roadway.

As a result of intensive and continuous research the railroads are at present effecting economies running into millions of dollars a year through repair and reclamation of locomotive and car parts, through the extension of rail life by the building up of wear and batter and through the use of the highly efficient oxy-acetylene cutting procedure in the manufacture of new parts, in the stripping of equipment for repairs and in the demolition of obsolete locomotives and cars.

The evolution from the embryo state of twenty years ago to the present high stage of development has resulted from the combined efforts of The Oxweld Railroad Service Company and affiliated Units of Union Carbide and Carbon Corporation.

The Linde Air Products Company, the World's largest producer of oxygen and The Prest-O-Lite Company, Inc. have worked out the problems of gas production and distribution.

Oxweld Acetylene Company, the World's largest manufacturer of oxy-acetylene equipment and supplies has solved the intricate problems of apparatus design.

Union Carbide and Carbon Research Laboratories, Inc. have developed the special rods best fitted for specific applications and have also contributed to the development and standardization of the most efficient welding and cutting procedures.

The Oxweld Railroad Service Company, through its service arrangement, whereby engineers and welding experts work with the railroad organizations in the introduction and perfection of welding and cutting procedures, has placed at the disposal of the railroads the facilities and experience of this great organization devoted to the development of the art of oxy-acetylene welding and cutting.

OXWELD RAILROAD SERVICE

THE OXWELD RAILROAD SERVICE COMPANY

Unit of Union Carbide and Carbon Corporation

UCC

NEW YORK, Carbide and Carbon Building
CHICAGO, Carbide and Carbon Building

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on behalf of its subsidiaries

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PULLMAN CAR AND MANUFACTURING CORPORATION
STANDARD STEEL CAR CORPORATION
PULLMAN-BRADLEY CAR CORPORATION

announces
creation of a Research Department
for development of transportation equipment
under the supervision
of

Mr. E. E. ADAMS, Vice President.

—o—

You are invited to use this service for
consideration of your problems in
the above field.

Chicago, Illinois.

NEW

Power and Welding Units

FOR MAINTENANCE OF WAY

—*built to your specifications*

NEW problems in railroad track maintenance, brought about by the growing demand for economy and the increased wear and tear of high-speed trains, have introduced new tools and new methods.

One of a series of advertisements featuring self-liquidating modern improvements that many railroads are applying to reduce costs in shops, maintenance of way, and signaling operations.

The experience of a number of Class I railroads has proved that *arc welding* effects substantial savings in reclaiming battered rails, worn crossings and turn-out frogs, and in the repair and construction of bridges and structures.

Westinghouse

Quality workmanship guarantees every Westinghouse product

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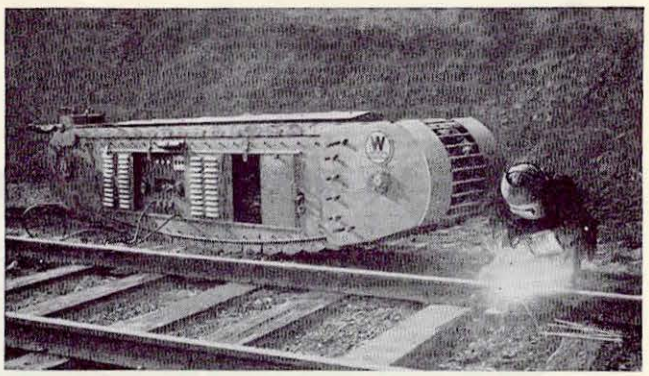
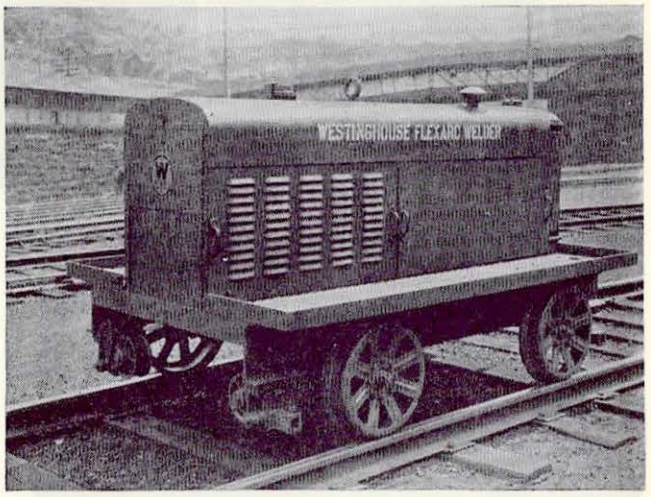


Westinghouse Tractor Welder and auxiliary-power unit. It is only 30 inches wide and 36 inches high, reaches positions inaccessible to other types of machines, permitting the use of short welding cables.



Westinghouse Trailer-type Arc-welding and Auxiliary Power Car for track maintenance work. This rail car is equipped with transverse rollers for quick de-railing.

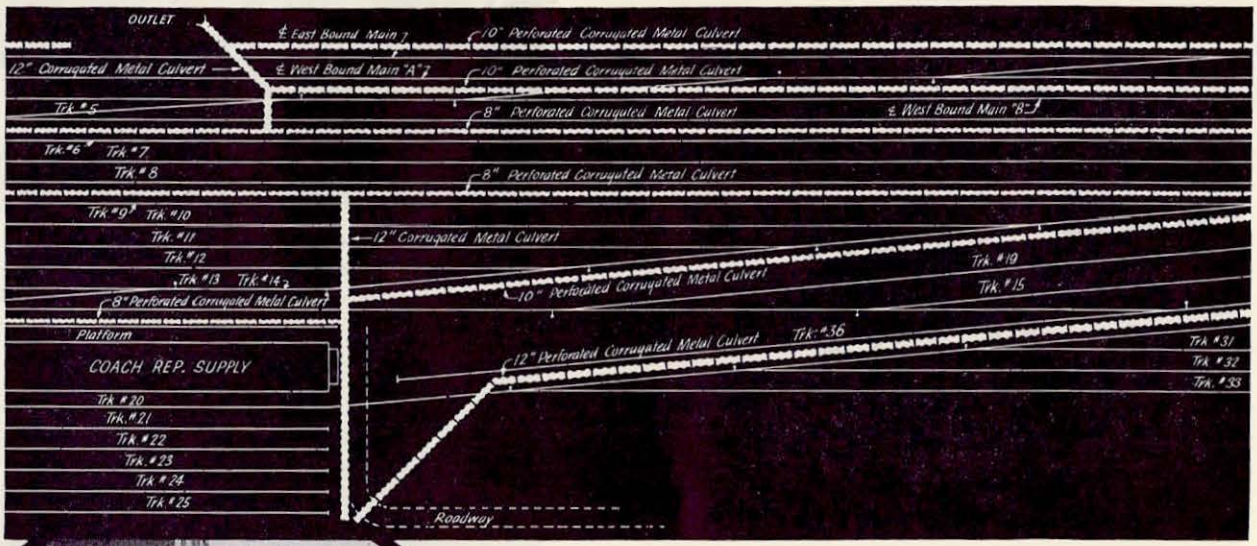
Also, *electric drive* greatly reduces the cost of operating grinders, slotters, drills, nut tighteners and similar track maintenance tools.

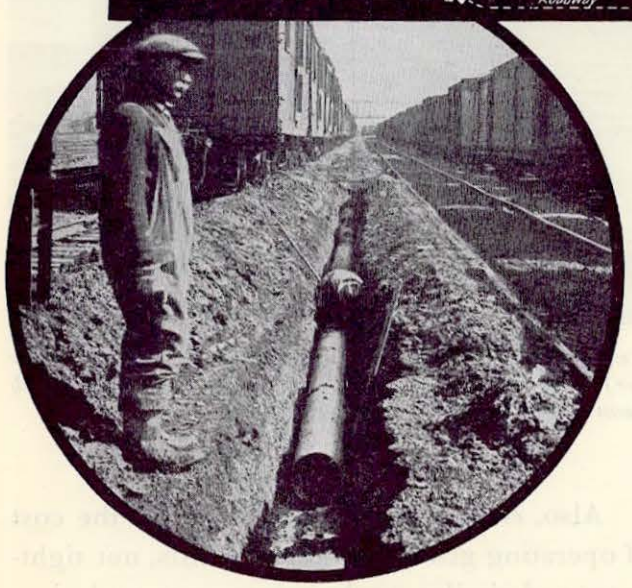
Westinghouse has developed tractor welders, and both trailer-type and self-propelled rail cars . . . with or without derailing mechanisms . . . which permit the more efficient use of the electric arc and electric power for driving roadway maintenance tools.

Westinghouse can supply any type of portable or stationary welding, or power unit for railroad use. We invite you to investigate Westinghouse equipment already developed, or we shall be glad to build to your specifications.

For further information, call the nearest Westinghouse office or simply address Room 2-N, Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania.

FOR EFFECTIVE YARD DRAINAGE





RAILROAD yards are often laid out with little attention to drainage. The tops of the ties are flush with the ground and the ground is made as even as possible between tracks so that there will be an even surface for the workmen to walk upon, and the trainmen will have greater ease and less danger in swinging off and onto cars. Though a surface of cinders or gravel may keep the ground fairly dry for a short time, its effectiveness is short-lived. Water begins to collect in large pools in the low spots in the yard. In time there is mud and water between the tracks and between the rails. The footing becomes unpleasant and dangerous. The track sinks into the soft ground and cars are shunted with difficulty. Tie plates rust out and ties rot out from being for long periods covered with mud and water.

An adequate system of yard drains will keep the ground dry, reduce the maintenance cost, make working conditions better, and reduce accidents. Drains of perforated corrugated Toncan Iron, placed two to four feet below the track and back-filled with a suitable porous material, will carry away the surface water. The drains should be in a well-designed network. It is not necessary to have a drain between each track, but they should be so placed as to receive the surface water at low points where it is delivered by the natural slope of the ground. The drainage of such facilities as cinder pits, water tanks, coal chutes, turn tables and around platforms may be all incorporated with the track drainage into one system or network.

Toncan Iron Culverts will be found most efficient because this alloy of refined iron, copper and molybdenum is longer lasting in railroad service.

Write for a copy of the Toncan Culvert Handbook. It presents full engineering information that will be of value to you.

TONCAN CULVERT MANUFACTURERS' ASSOCIATION

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CAST STEEL SIDE FRAMES

Thirty-five years experience in the development and manufacture of cast steel products has created a standard of quality which is reflected in the universal acceptance of American Steel Foundries products in the construction and maintenance of modern railway cars and locomotives.

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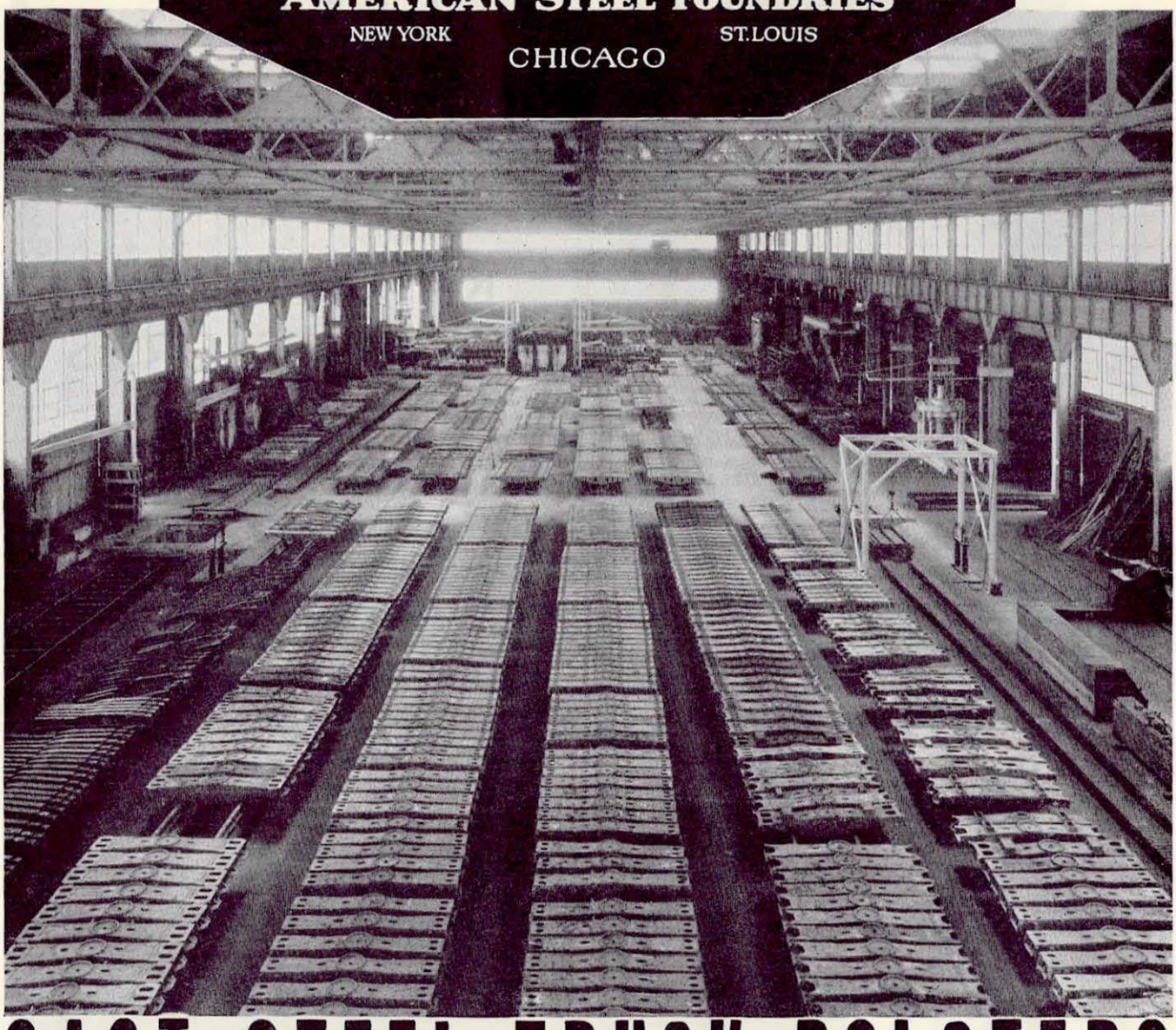
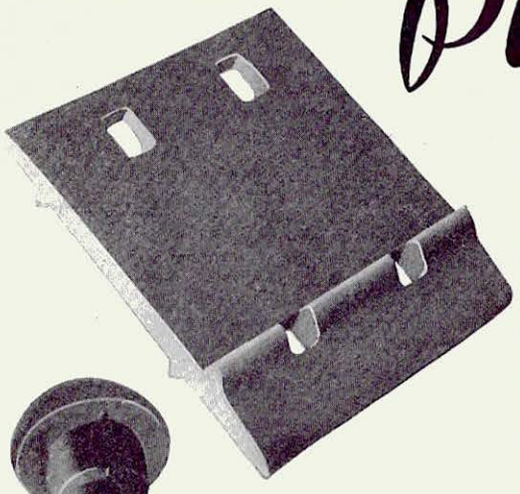


CAST STEEL TRUCK BOLSTERS

TENNESSEE

Pledges



PROMPT

DELIVERY

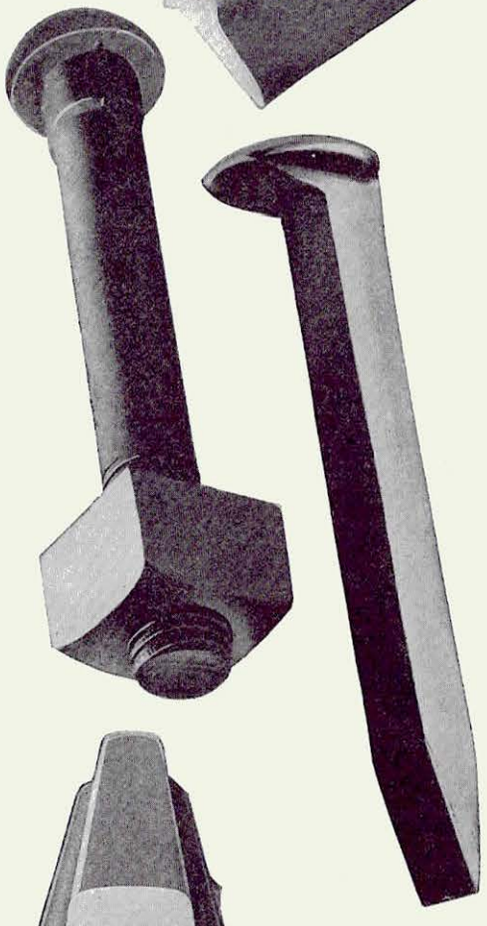
and

FINEST QUALITY

on

RAILS and

TRACK ACCESSORIES



Rely on Tennessee when you need prompt service—service based on years of experience in knowing what the railroads want and how they want it.

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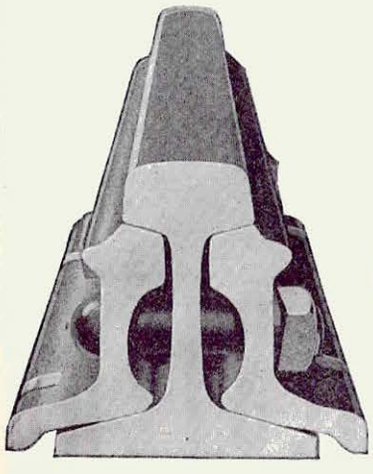

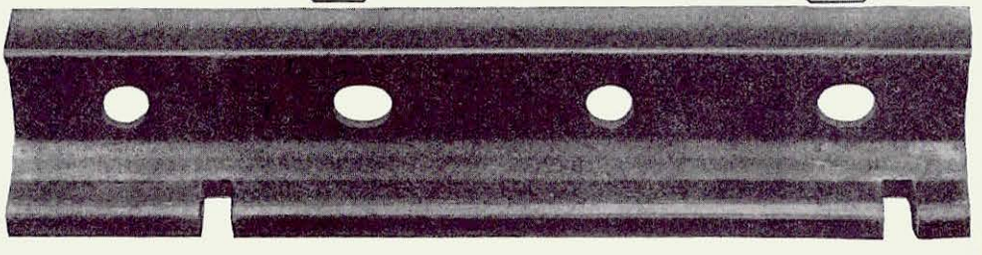

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5. Creosoted timber saves money in grade separation*

Quality is inherent in AmCreCo Products
(ties, piles, poles and timber)
Because:

1. Only carefully selected timber is used.
2. Woods practice and plant handling protect against incipient decay.
3. Treatment is accurately timed to proper seasoning.
4. Only creosote from pure coke oven or coal gas tar is used.
5. The wood is adequately treated.
6. Framing before treatment is standard practice.
7. The facilities and personnel of the leading producer in the industry are back of every AmCreCo product.

RAILWAYS are often required to carry out expensive grade separation projects.

Creosoted timber is logical for highway viaducts in such work because it has a long life and a low cost. The latter fact is particularly vital when earnings are low. The frequent changes in highway location and in traffic routing, rendering highway bridges obsolete, is a further reason for favoring the high salvage value of creosoted timber in the building of such structures. Ask for cost estimates.

AMERICAN CREOSOTING COMPANY
INCORPORATED

COLONIAL CREOSOTING COMPANY INCORPORATED — AMCRECO LOWRY PROCESS CREOSOTED WOOD — GEORGIA CREOSOTING COMPANY INCORPORATED

LOUISVILLE — KENTUCKY

**The fifth of a series of discussions, pointing out reasons for the economy produced by AmCreCo products.*

Universal Dry Lading Roof Economies Sum Up Like This

THIS roof consists of only 9 one-size, one-design parts and will fit all widths, all lengths, all designs of house cars on standard gage track. It is so adjustable that it does what it takes thousands of other roofs to do. It costs less to apply and practically nothing to maintain.

Its weatherproofing protects the lading against the elements and protects railroads against damage claims.

It does not require roofing boards. It allows free ventilation so that sweating is prevented in cars loaded with commodities that give off moisture.

Its weatherproof parts are made from spelter coated steel — the greatest protection against rust and deterioration.

It holds the car frame the most rigid and reduces the strain on the superstructure. The carlines, purlines, caps, saddles and flashings are rigidly secured to the car and to one another.

It does not require a big stock for maintenance and prevents delays to repairs.

And here is a splendid dollars and cents example of these economies. The maintenance on Dry Lading Roofs was only $4,519.49 for 18 years on 30,000 cars owned by the largest railroad in North America. Less than one cent per roof per year. Some record!

Hutchins Car Roofing Company

Maintaining The Improvement In Business

General business, as measured by freight car loadings, improved more than seasonally in April, May, June and July, and then improved less than seasonally in August. In July average weekly car loadings were only 38.4 per cent less than in July, 1925-1929, and 28.4 per cent greater than in July, 1932. In August they were almost 42 per cent less than in August, 1925-1929 and only 21.1 per cent greater than in August, 1932. Electric power production, the other of the two best measures of general business, showed the same trend.

The gigantic speculation in the decade ending with 1929 occurred, and has been followed by the depression of 1930-1933, because so many public men, business men and publishers of and commentators upon news failed or refused to ascertain facts, to state them correctly and to act in accordance with the conclusions they obviously suggested. The termination of the depression and the revival of prosperity will be accomplished only by following an exactly opposite course. The plain fact is that in August, as compared with the four immediately preceding months, general business showed a declining tendency, and it is essential to recognize the fact, to try to remove its causes and to put in operation influences of a stimulating instead of a retarding tendency.

Why General Business Lags

General business improved during the last one-third of 1932 owing to natural economic causes. The improvement was arrested in the first quarter of 1933 by the deterioration of the banking and credit situation which resulted in the banking moratorium in March. The reopening of the banks under needed restrictions upon withdrawals of deposits was immediately followed by a revival of the improvement in general business, which again was due to natural economic causes, but which undoubtedly was stimulated by forward buying of commodities in anticipation of the increased costs and prices anticipated because of the recovery program of the administration, including inflation. Probably in July, at least, business was artificially stimulated by the government's actual and anticipated policies, and the reaction in August probably was partly due to the fact that the forward buying due to this stimulation was reduced.

It seems highly probable, however, that in at least equally large measure the reaction in August was due to new problems and uncertainties injected into business by the government's various recovery policies. Business men have been accustomed to weighing a number of more or less familiar factors in trying to solve their problems, and when a large number of entirely new factors which they are not accustomed to weighing—and which they actually cannot weigh, because their importance is dependent upon what is going to be done in Washington by men who do not themselves know what they are going to do—are introduced into the equation, there is likely to be caused a hesitation by many business men in regard to what they should do which results in them not doing anything at all except marking time.

One important factor of uncertainty that is being introduced into business is the attitude of the administrators of the recovery legislation toward losses and profits. Business men are motivated principally by the desire to avoid losses and make profits. Many of them have been virtually forced by the government, at a time when they are still making losses, to increase their operating expenses without any assurance that they will get any increase in their earnings, and even at a time when the brain trusters in Washington are glibly saying that the time when business could be conducted principally to make profits is past. Furthermore, much alarm has been spread through business by the apparent tendency of the government to favor a labor policy which labor leaders throughout the country construe to mean the closed shop. In consequence, the administrators of the government's policy have succeeded in spreading fear instead of confidence through a large part of business, and the fear of losses and boycotts is not a good substitute for confidence among business men as a means of promoting recovery.

Improvement Needed in "Capital Goods" Industries

The company which published the *Railway Age* has taken the steps necessary to comply with the requirements of the National Recovery Administration, and

consequently has begun publishing in its papers the blue eagle insignia which indicates that "we do our part." This is no indication, however, that we believe that all these "recovery" policies have helped, are helping or will help business. We do believe that, regardless of the administration's recovery activities, general economic conditions in the country are much better than they were a year ago, and that they will continue to improve if business men will show the ability, initiative and courage upon which the revival of business is just as dependent, and perhaps more dependent, as it would have been if most of the recovery legislation had never been enacted. To a real revival of business an increase in purchases of consumers' goods is necessary, but most essential of all is a real and relatively great increase in activity and employment in the capital goods industries, because the decline of activity and employment in the capital goods industries was the greatest and the revival in it as yet has been the least.

Effects of Increased Railroad Buying

Among the greatest of the capital goods industries is that which consists of the manufacturers of railway equipment and supplies, and, therefore, we are in entire accord with certain views expressed by Federal Coordinator of Transportation Eastman in a letter written by him on September 2 to railroad presidents and railroad labor executives. In this letter Mr. Eastman said, "One thing for (the railroads) to do is to use every available dollar, as traffic and revenue increase, to put more men to work. There is so much deferred maintenance and other work which sorely needs to be done that this will not only help the country but be the soundest of economy. * * * I also call attention to the fact that money can now be borrowed on favorable terms from the Public Works Administration for railroad equipment and maintenance. Thus far no railroad has availed itself of this opportunity. Yet such expenditures are needed, and they would strengthen the recovery program at an important point. The railroads will not play their proper part if they neglect these opportunities." He also urged railway officers and employees to adopt measures which would spread the employment at present available among more men.

A Critical Stage in Recovery

The nation is now at a critical stage in its efforts to recover from the depression. No other industry has benefited more up to the present time by the improvement in general business than the railroad industry. No other industry would benefit more by a continuance of the improvement. No other news that could be published would create a more favorable public sentiment toward the railroads, and have a more stimulating effect upon business confidence and general business activity, than the news that the railroads had concertedly adopted a program to use their increased earnings and money that they can borrow from the government, to make large increases in their employment of labor and their purchases of equipment and supplies to improve their equipment and other properties and to help promote the revival of business. Its direct effects upon business, and its indirect effects upon the morale of business men and the public, might prove the stimulus most needed to arrest the lag in business and renew the improvement necessary to provide the continued increases in traffic and earnings essential to restoring the railways themselves to reasonable prosperity.

Eleven years ago, in the latter half of 1922, business was reviving from the post-war depression, and the railways soon entered the market with the largest orders for equipment and supplies that they had placed in a decade. They thus contributed very substantially to the revival of general business which, in 1923, gave them the largest freight traffic and gross earnings that they had ever had in any year up to that time. They may have an opportunity now to do more to win public favor and stimulate the revival of general business than they had then, and they cannot afford to miss any such opportunity.

Woodlock on British Railway Methods

In the *Railway Age* last week was published a short article pointing out the applicability of many British railway methods to the solution of present problems which face the American railways. This article was written by Thomas F. Woodlock, former Interstate Commerce Commissioner, and appeared originally in the Wall Street Journal. It is highly significant because Mr. Woodlock is not only a sympathetic student of railway problems, but a discerning one as well, and when he reaches the conclusion, which he has reached, that "our railroads might well send a committee of traffic managers" to Britain to study and report upon their accomplishments, then the suggestion is one which should not be lightly dismissed.

Mr. Woodlock has been in England for some weeks studying economic conditions, and what he has seen is illuminating. The British railways, it appears, have developed their services and their rate structure to the point where they are seriously challenging their highway competitors for traffic. They have carried the use of the unit freight container much farther than we have. They are, in addition to excursion services of even greater liberality than our own, offering fast passenger transportation anywhere at two cents a mile. They hold themselves out to take over the entire transport task of any business concern, not only providing truck service in connection with rail hauls, but all-highway services as well, and even local delivery services. In this way, a concern which will contract with the railway for its total transport work may dispense

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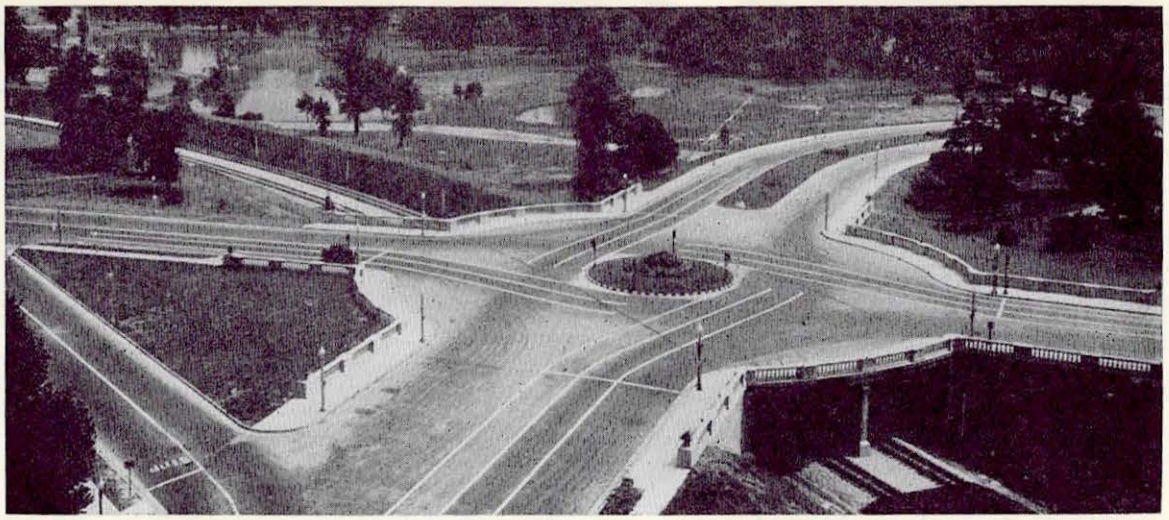


A General View of the Intersection of Union and Lindell Boulevards on the Structure Over the Wabash Tracks

Depresses Tracks Formerly Elevated To Eliminate Grade Crossings

Unusual project on the Wabash included more than 16 acres of sodding and the replacement of an 80-ft. subway with an overhead bridge

AN unusual grade separation project was completed recently at St. Louis, Mo., by the Wabash at a cost of approximately $700,000, which involved, among other novel features, the abandonment of an 80-ft. subway at a park boulevard, which has long been widely known for its architectural excellence, and its replacement with an overhead crossing, and the construction of a bridge designed as a reinforced-concrete box 200 ft. long and 64 ft. wide to eliminate a grade crossing at the intersection of two other important boulevards. Not the least interesting feature of the project, however, was that the plans required the depression of two main tracks, which had formerly been included in a track elevation project, up to a maximum of 18 ft. for more than a mile through Forest park, the largest park in the city, and the relocation of these tracks for practically the entire distance covered by the improvement.

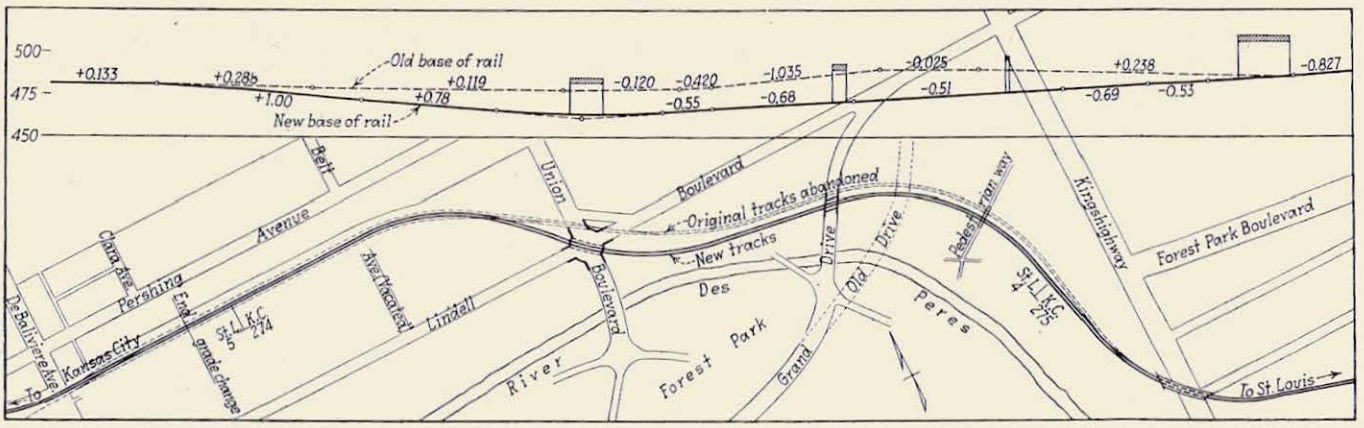
Owing to the fact that the section of line involved in the improvement lies in Forest park, the city required the construction of an embankment or levee on either side of the roadbed of sufficient height to hide the view of trains, and the sodding of all graded surfaces, totaling more than 16 acres of superficial area. In addition, 12,000 lin. ft. of sewer was constructed and a 16-ft. circular sewer was relocated and depressed, while the work also included a large area of street paving and concrete sidewalks.

The double-track main line of the Wabash between St. Louis and Kansas City enters Forest park from the east through a tunnel under Kingshighway, which forms the eastern boundary of the park, and runs northwesterly across the northeast corner of the park, emerging at the intersection of Lindell and Union boulevards about 4,000 ft. to the west. About 1,500 ft. beyond Union boulevard the line turns directly to the west and parallels Lindell boulevard. The grade separation and track depression project extended from the east line of Kingshighway on the east to 2,500 ft. west of Union boulevard, a total distance of 6,770 ft.

At the time the improvement was started, the tracks were carried through the park on an embankment ranging up to 18 ft. high. They crossed Lindell and Union boulevards at grade a short distance east and north, respectively, of their intersection. The work consisted in relocating the two main tracks from 35 ft. to slightly more than 100 ft. south of their original location and depressing them enough to allow these streets and Grand drive to be carried overhead. To permit the lowering of the tracks, it was necessary to relocate and depress a 16-ft. circular sewer on Union boulevard 9.5 ft. for a distance of 620 ft. and to construct a new connection with the covered section of River des Peres.

Three Boulevards Are Affected by Project

Three boulevards were involved in the project. The most important of these is Lindell boulevard, which forms the northern boundary of Forest park and is the principal east and west artery for a large volume of high-speed traffic between St. Louis and a highly developed suburban territory west and immediately north of Washington university. Union boulevard, another of the streets involved, although less important as a through street, provides the principal entrance to the park for an extensive and important residential section on the north. For this reason, this street carries a relatively heavy traffic into and out of the park and also



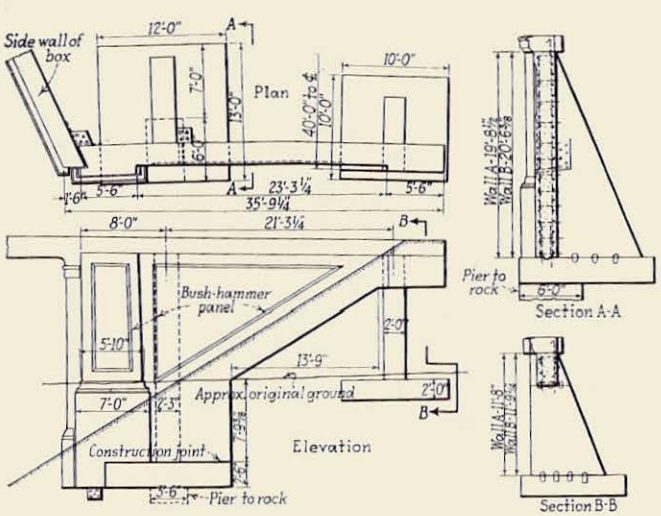
Map and Profile of the Grade-Separation Territory

carries considerable traffic destined to and from the east on Lindell boulevard. As explained, both of these streets are heavily traveled, traffic counts having indicated that on an average day 22,500 vehicles and 700 pedestrians pass over their intersection.

Grand drive, the third of the boulevards affected, is one of the main arteries through Forest park and about equal to Lindell boulevard in importance. Beginning at the junction of this boulevard and Kingshighway, it runs southwesterly, forming a link in the route from downtown St. Louis to Clayton and the large residential suburban territory between, while considerable traffic reaches it from farther south. For many years this drive has been one of the important arteries leading west from St. Louis, so that it has always carried a relatively dense traffic.

At the time the railway was originally constructed in 1875, Forest park was being developed, and by agreement between the railway and the board of park commissioners, the railway was elevated on an embankment through the park and a bridge was constructed by the park commissioners to carry Grand drive under the tracks. The Grand Drive bridge was reconstructed in 1904 to provide a wider opening for the highway in order to take care of the increase in traffic to the World's Fair held in Forest park that year.

In view of the work that had already been done, it would have seemed that the logical method of eliminating the Lindell and Union crossings would have been to extend the track elevation westwardly and carry the tracks over the streets. This was not satisfactory to the city, however, and after protracted litigation the railway was required to depress its tracks from Kingshighway to west of Union boulevard, thus rendering useless the investment in track elevation and the grade separation at Grand drive.



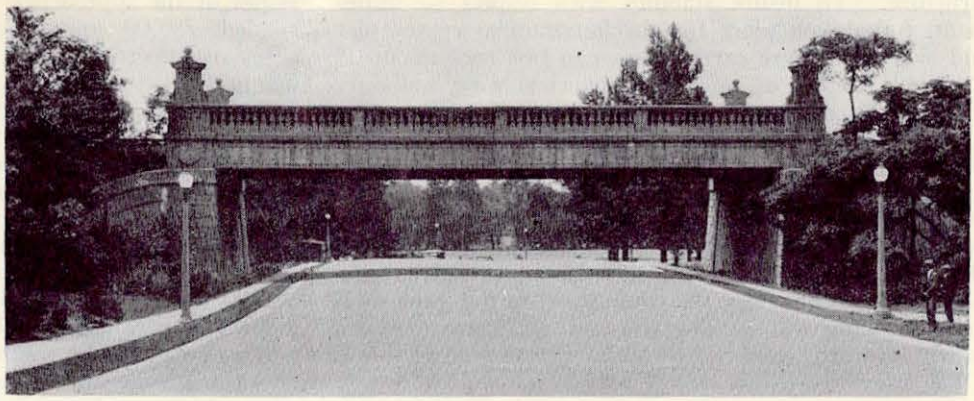
Unusual Wing-Wall Design Employed at the Union-Lindell Overcrossing

Widely-Known Subway Abandoned

Not the least interesting of the novel features involved in this project was the abandonment of the subway at Grand drive and its replacement with an overhead crossing, which was made necessary by the depression of the tracks. Ever since it was built, this bridge has been widely accepted as a model for the architectural design of grade separation structures. It consisted of a clear span of 80-ft. through plate girders carrying the tracks over the drive, which were supported on concrete abutments having curved wing walls. To harmonize the structure with its surroundings, the girders were masked by fascie of reinforced concrete surmounted by ornamental railings and flanked by low pylons which rose from the abutments. A judicious arrangement of shrubbery and other foliage along the drive added to the effectiveness of the architectural treatment. Since drainage did not permit the lowering of the drive, it became necessary to replace the subway with an overhead crossing, which for convenience of construction was located about 400 ft. farther west.

As already mentioned, the tracks were relocated over practically the entire distance affected by the improvement, the shift ranging from 35 ft. to slightly more than 110 ft., the former being the minimum that would permit carrying out the sequence of the construction program. Since the tracks crossed Lindell and Union boulevards east and north of the street intersection, a shift of 110 ft. to the south brought the tracks squarely at the street intersection and thus not only combined the overhead crossing in one structure instead of two, but also avoided an undesirable grade condition on the streets.

The first step in the construction program, after the 16-ft. sewer was lowered and such new sewers as were needed were built, was to prepare the roadbed on the new alinement and construct the bridges that carry the boulevards over the tracks. The tracks were then laid and trains were routed over the new line. This move was followed by the construction and paving of the approaches to the overhead bridges. Simultaneously, the old tracks were removed and the embankment was graded down to form a ridge or levee of uniform cross section, which serves as a screen shutting off the view of trains from the north. To mask the view from the south, the material from the old embankment was moved across the tracks and added to that obtained in grading



The Grand Drive Underpass in Forest Park, a Famous Structure that was Razed to Make Way for the New Track Depression

the new roadbed to form a similar ridge which effectually shuts off the view of trains from that side.

Originally, the tracks rose from Kingshighway to Grand drive on a 0.2 per cent gradient and then descended to Union boulevard on a broken gradient ranging from 0.12 to 1.03 per cent. The new grade, although broken slightly at several places, descends continuously from Kingshighway to Union boulevard, averaging 0.7 per cent, compensated for curvature. Although the lowest point in the new roadbed is at the crossing of Lindell and Union boulevards, the greatest difference between the old and new grade lines occurred at the summit of the 0.2 per cent ascending grade immediately west of the original location of Grand drive, at which point the tracks were depressed 18 ft.

Difficult Drainage Problem Encountered

In depressing the tracks a difficult problem of roadbed drainage was encountered, particularly in the vicinity of Union boulevard. A stream known as River des Peres rises several miles north and west of Forest park and flows generally southeasterly through the city of St. Louis. It enters the park from the north near its western boundary, but turns east and flows practically parallel to and about 400 ft. south of Lindell boulevard to the eastern limits of the park where it again turns south. This stream is subject to sudden rises and for this reason as well as because it has cared for considerable city drainage the channel has been straightened and enlarged and covered through the park.

To provide drainage for the roadbed, it was necessary to use the River des Peres as the outlet. It was found, however, that the permissible hydraulic gradient in the outfall drain intersected the south ditch line of the roadbed at the low point in the gradient at an elevation only 3.2 ft. below the top of rail or, allowing for 18 in. of ballast, only 6 in. below subgrade. This situation made it necessary to construct shallow side ditches and install catch basins at frequent intervals.

Although the tracks at Lindell and Union boulevards were depressed to the limit allowed by the drainage, 13½ ft., this was not enough to provide for the minimum clearance of 18 ft. which had been agreed on, and it became necessary to raise the streets 7½ ft. at the intersection. This provided only 3 ft. from the point of clearance to the surface of the street, thus necessitating a thin-slab construction.

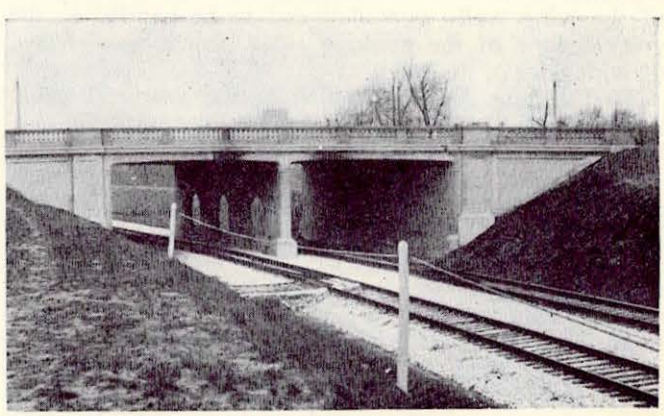
Character of Grade Separation Structures

In view of the volume and character of the street traffic, the proximity to the highly developed park and the high-grade residential section, considerable effort was devoted to designing the structures and their approaches to make them ornamental. For this reason, the intersection of Lindell and Union boulevards, instead of being allowed to remain rectangular, was designed as a traffic circle of 100-ft. radius with a small circular grass plot and flower bed at the center. This grass plot proved to be somewhat of an obstruction to the free movement of traffic, since it was compelled to move in circumferential lines, and it has now been removed and the area paved, thus permitting vehicles to make through movements in straight lines. A marginal street in the northeast angle of the intersection, which was adjacent to the tracks in their former location, has been retained. This permits traffic between Lindell boulevard on the east and Union boulevard on the north to bypass the intersection, thus making a considerable reduction in the volume flowing over it.

Novel designs were employed for the bridges which carry the streets over the tracks, thin reinforced sections being used throughout. The structure at Lindell and Union boulevards is a twin-span design which is in effect an inverted reinforced concrete box having three sides and no ends. This structure is on a 4-deg. curve and to accommodate the circular arrangement of the street intersection, it is 200 ft. long, measured longitudinally with the track, and 63 ft. wide, sufficient to accommodate four tracks.

The roadway slab was made continuous over two spans and is supported at the center by a longitudinal pier of the open-arch type. The sides of the box, which serve the dual purpose of supporting the floor slab and of retaining the earth of the approach embankments, are continuous with the floor slab, although the structure is not designed in accordance with the principle of rigid frames. All sections, including floor slab, walls and center pier, are two feet in thickness, the total depth from roadway surface to under clearance being only three feet.

Owing to the thin sections employed, the length of the structure and the crowded vertical clearance, it was important to avoid settlement or other distortion in the



The New Overhead Bridge at Grand Drive

structure. To insure stability with respect to settlement, foundation piers for the longitudinal center pier and side walls were carried down to bed rock about 35 ft. below the top of rail. The detached wing walls are supported in the same manner at the ends adjacent to the side walls, but for the outer end the support is a reinforced concrete slab 10 ft. square. To resist overturning, counterforts are provided at the inner and outer ends of these walls. That at the outer end is designed to be integral with both the wing wall and the footing slab. A specially designed slab 12 ft. square is provided as anchorage for the counterfort at the inner ends of these wing walls. The side-wall slabs are designed to withstand the earth pressures by functioning as simple

Embankments to Shut Off the View of the Tracks, and Sodded Slopes were Special Features of the Project

spans between horizontal supports provided at the top by the deck slab and at the bottom by reinforced concrete transverse struts extending between the foundation piers.

Similar designs for the superstructure and foundations were used at Grand drive. This bridge is only 84 ft. long, however, and 64 ft. wide. The vertical clearance is 18 ft. To conserve concrete, the bottoms of the wing walls were designed to be parallel to the graded slope of the masking ridge, which was erected on both sides of the track.

To facilitate the construction of the overhead structure and allow the old subway to be used until the new line was completed, Grand drive was relocated about 400 ft. west of its original location. A stone arch pedestrian underpass located under the track on the old line between Grand drive and Kingshighway was destroyed by the depression of tracks and was replaced with an overhead steel truss bridge to enable pedestrians to cross over the new line of railway. This forms a more direct route than Grand drive from the street car and bus lines into the park.

In an effort to harmonize the completed work with the surroundings, all graded surfaces, including the slopes of the approaches to the overhead bridges, were sodded, 79,000 sq. yd. of surface, or more than 16 acres of superficial area, having been finished in this manner.

As a part of the project, it was necessary to install approximately 12,000 lin. ft. of new sewer, ranging from 12-in. vitrified sewer pipe to a 42-in. brick sewer and including two sizes of concrete pipe. For roadbed drainage, 6,500 lin. ft. of 8-in. perforated corrugated iron pipe was required. The new paving consisting mostly of an asphalt wearing surface on a concrete base, totaled 28,000 sq. yd. In addition, 56,000 sq. ft. of concrete sidewalks were laid and 1,000 lin. ft. of cut-stone hand rail was installed on the bridges and approaches.

Although the grade separation structures were not of unusual size and were designed specifically to reduce the volume of concrete to a minimum, 5,200 cu. yd. of concrete was required for their construction and 537,000 lb. of reinforcing steel. The foundation and other excavation necessitated by the structures totaled 4,000 cu. yd.

The general plans were developed by L. R. Bowen, chief engineer of the division of bridges and buildings of the department of the president of the board of public service of the city of St. Louis. Bridges, paving and drainage facilities were designed and constructed under his direction. All railway work was handled by company forces of the Wabash.

Woodlock on British Railway Methods

(*Continued from page 358*)

with its own trucks, and thus not be tempted to use them for long-distance hauls.

In Great Britain, there has also been a great amount of pooling of services among the railways and the avoidance of expensive duplications. Intensive research into new methods and costs of specific services has enabled the companies to concentrate upon the traffic which can be handled at the greatest profit. Research has also led to modernization of a handsomely profitable kind. Mr. Woodlock concludes that the British railways have at last "got hold" of the railroad problem and "if the world is going to recover at all, there is ahead of them something like the old prosperity of twenty years ago."

One could hardly find a more encouraging statement on the railroad situation, because there can be no doubt but that the same approach to it which Mr. Woodlock has observed in Britain is also making rapid headway on this side of the Atlantic. This is true not only upon the individual railways, but it is remarkably so of the work which the federal co-ordinator and his staff are undertaking. It is, of course, too early to gage the probable success of these efforts, but no discerning person who has noticed the character of the inquiries being made by the co-ordinator's office can have failed to notice that at least a serious attempt is now being made to supply the railway industry with the kind of detailed market and method analysis which has for so long been its outstanding need. We welcome this effort on the part of the co-ordinator and his staff. We believe also that Commissioner Woodlock's suggestion that we try to learn as much as we can from the successful efforts of our British comperes is an excellent one. Railroad men come from all over the world to our shores to learn our railway practices. Is it not quite possible that we also might, with profit, reverse this process to some degree?

Welded Structures Reduce Diesel Engine Weights*

Rigidity and endurance have thus been built into engines weighing less than 10 lb. per hp.

By Everett Chapman†

ONE of the factors which has prevented the Diesel engine from assuming its rightful place as an important prime mover in transportation units has been its excessive weight. The transportation field, including marine and railroad work, has been definitely closed to the Diesel engine because of its usual specific weight ratio ranging from 40 to 250 lb. per hp. Many successful applications have been made in marine service and railroad yard service, but these installations have included only the most probable ones. The possible and likely applications, such as main-line passenger and freight service on the railroads, have thus far been untouched.

A great deal of the weight involved in a Diesel engine is intimately connected with that part of the structure —the crankcase—which functions to connect the main gas load with its reaction point, the main bearings. The combination of high combustion pressures and large piston diameters results in loads of large magnitude. The strict requirement of structural rigidity, coupled with the fatigue nature of the load, demand that the usual cast material be worked at low stresses, which results in the excessive weight figures that are usual practice today. The tension nature of the load, imposed on a material that is not well suited to tension loading, results in a composite structure consisting of steel tie rods connecting the main bearings with the cylinder heads. These rods are in turn surrounded by a cast-iron structure which supplies the necessary rigidity for minimizing vertical deflection due to the gas loads and the horizontal components resulting from the inertia loading of the crank pins and rods.

* Abstract of a paper presented before the meeting of the Oil and Gas Power Division of the American Society of Mechanical Engineers at Atlantic City, N. J., August 23.

† Vice-president in charge of engineering, Lukenweld, Inc., Division of Lukens Steel Company, Coatesville, Pa.

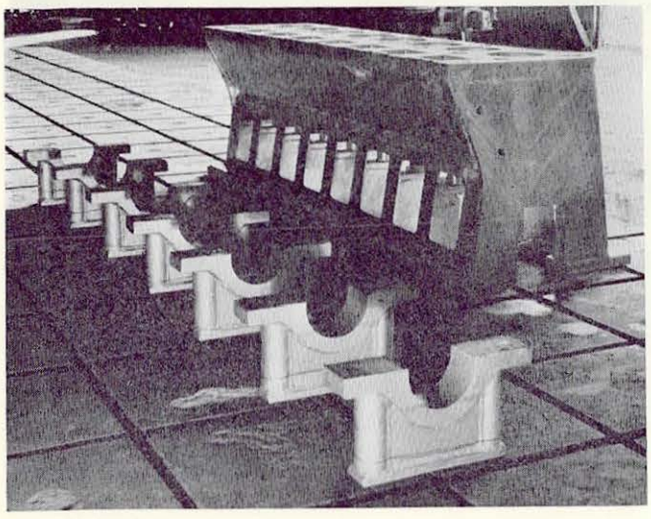


Fig. 1—A Welded Crankcase with Bearing Grids

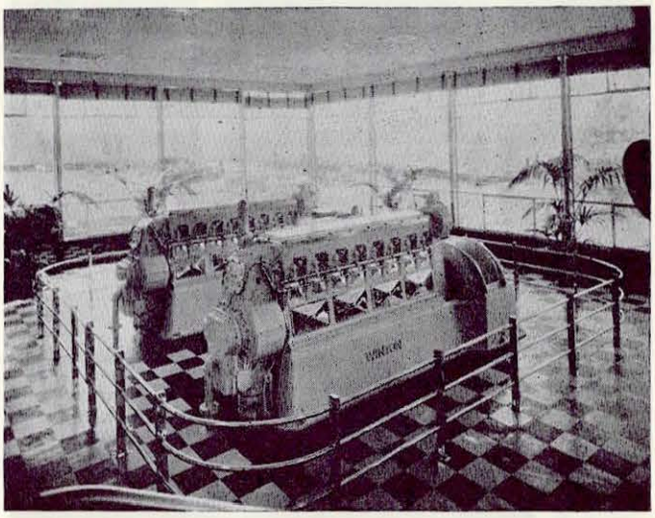


Fig. 2—Winton Two-Cycle Diesels with Welded-Steel Structures

The first step in the reduction of the weight of the usual arrangement naturally contemplates the use of steel instead of cast iron as the structural material. Steel, with a modulus of elasticity of 30,000,000 in contrast to cast iron with a modulus of 12,000,000, can provide a structure of similar section working at the same stress as the old one, but with only 40 per cent of the deflection.

The other physical characteristic of steel which enables a lighter-weight construction is its higher endurance limit as a fatigue-resisting material. Steel's higher ultimate strength is not a controlling factor since the engine must not break. Its higher yield point is of no advantage because the structure is useless if a permanent set occurs. Its superior ductility is important only as an index to the cleanliness of the steel. It is, therefore, obvious that the modulus of elasticity and endurance limit of steel are the only two factors that permit any reduction in the weight of the crankcase of a Diesel engine.

Many attempts, accompanied by a few successful results, have been made to execute a light-weight Diesel crankcase in cast steel. But here again is an inhibiting factor in that cast steel will not flow in sections as thin as cast iron. Thus, the limitations of this manufacturing method legislate against any appreciable weight reduction.

The only alternative, then, is the use of rolled steel in the form of plates and shapes to build up the desired structure. To join the components riveting is out of the question, because the non-homogeneous semi-rigid joints will not stand up under the severe service of the

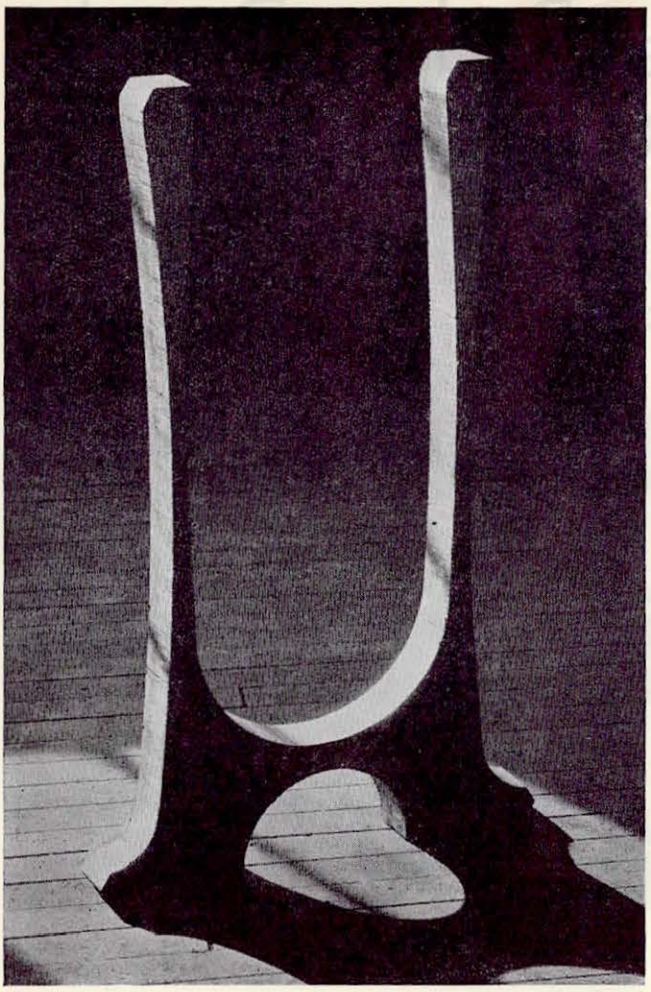


Fig. 3—A Main-Frame Member for a Welded-Steel Crankcase

Diesel type of loading. In contrast, welding is eminently suited as the method of fabricating the rolled-steel crankcase.

Stiffness and Endurance Life

Any questions that may be asked on the application of welding to Diesel engine crankcases center about two prime requisites, stiffness and endurance life, plus a secondary factor, corrosion resistance, which affects only those marine installations where salt water is used as a cooling medium.

Questions concerning structural rigidity are answered by the fact that steel is the stiffest commercial material known to man. The intelligent designer, who will delve into the possibilities of welded steel construction will find that the flexibility of the process enables him to go farther in exercising his ingenuity than any process he has ever used. Theoretically perfect distribution of the material is limited only by the designer's ingenuity and those features of the old construction which are incapable of change.

The problem of endurance life can be rather simply stated, although the subject as a whole is somewhat involved. In handling the severe loading conditions encountered in Diesel engine work over an equitable period of time it is necessary to study thoroughly the mechanism of fatigue failure. The essence of the matter is that the stress range through which the component materials can be repeatedly stressed indefinitely without causing failure must be known. The maximum stress in the structure, wherever it occurs, must be under the known safe value. A low average stress as usually calculated cannot possibly guarantee an indefinite service life. It is the maximum stress which governs. A point of maximum stress may lurk in a hidden corner with too sharp a radius. It may exist in the bottoms of small tool marks. It may be present at undercuts unconsciously made during the welding process. It may be found at any small blowholes or porosity in the materials. In particular, in the welding process, points of maximum stress always exist around an improperly designed welded joint. In an otherwise perfect design satisfying the rigidity requirements for successful functioning of the engine the only thing that will break the structure subjected to repeated load is the existence of a hidden minute defect in contour which multiplies the average stress condition by a factor of five, six or even more. Points of high local stress occur over such small areas that they have no influence on rigidity. Ductility cannot operate to alleviate a high-stress condition as it does in statically loaded structures, since this phenomenon requires a permanent deformation which is inadmissible in a crankcase that must preserve main-bearing alinement.

Design and Practice Requirements for Endurance

Stress factors of almost any magnitude can exist in a structure. A round hole in a body of material will raise the stress in its locality by a factor of 2.7. A round hole on the surface of a material will raise the stress three times. These factors are not serious since the demands of rigidity will call for average stresses which, when multiplied by these factors, will not constitute a source of worry. The serious type of stress concentrations against which the designer must guard diligently are those exemplified by sharp corners and re-entrant angles. Mathematically, the stress-concentra-

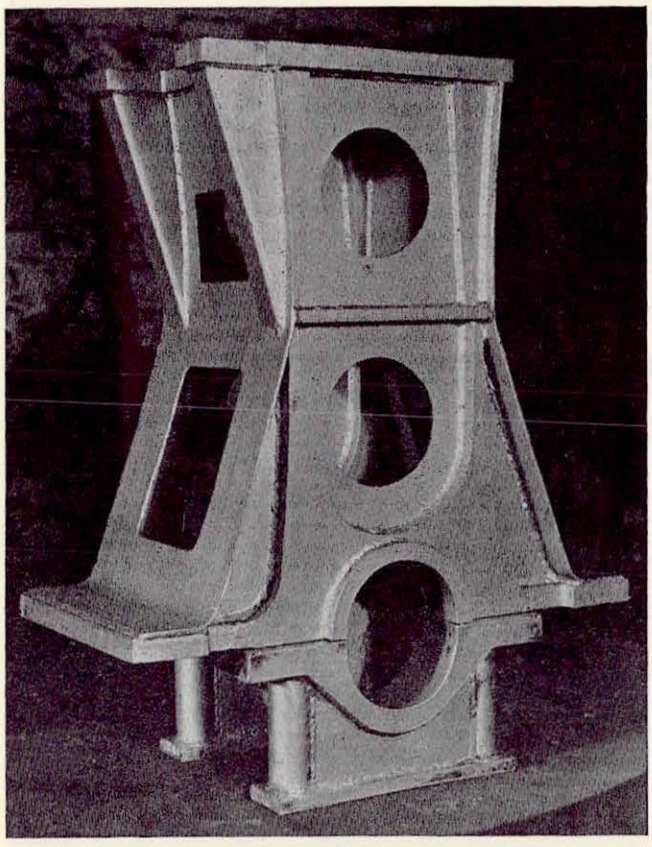


Fig. 4—The Built-up Single-Cylinder Unit

tion factor which exists at a corner or re-entrant angle is inversely proportional to the radius of curvature of the corner. If it were practically possible to achieve a perfectly sharp corner, the stress theoretically would be infinite. While it is practically impossible to machine a corner with a zero radius, there are many types of welded joints in which the radius is nearer zero than can ever be approached by machining. Concentrations of this nature cannot be tolerated.

When two plates are superficially welded together, either by two welds whose roots are not fused together or by fillet welds merely laid in the corners, there is an unwelded boundary on the interior of the joint. This crack is an integral part of the contour of the joint and has a tremendous influence on the stress distribution. Such joints will function properly in statically loaded structures, since the high ductility of the weld metal can allow sufficient plastic deformation, under high load, to correct the contour. They are suicidal, however, where the structure is subjected to repeated stress.

A triangular welded fillet shows marked concentrations at the ends of the weld. A concave fillet shows an evenly graduated stress, with the maximum value probably only two or three times that of the average stress. The concentration factor at the ends of the triangular weld can reach dangerous values. While the triangular-shaped fillet has more throat area and, therefore, a lower average stress, the maximum stress which exists is considerably higher than that around a concave fillet.

Other points to be considered are the condition of the weld, the endurance value of the weld metal, and the damage to the base metal by the high temperature of the welding operation. Heat treatment after welding is exceedingly important not only to correct the damage occurring during welding, but also to remove the residual stresses which are locked up in the structure. The other important phase of stress relief is that an unannealed welded structure will exhibit unseasoned properties worse than the greenest casting ever encountered. It will warp and twist on the planer and boring mill to a degree that will render the structure useless.

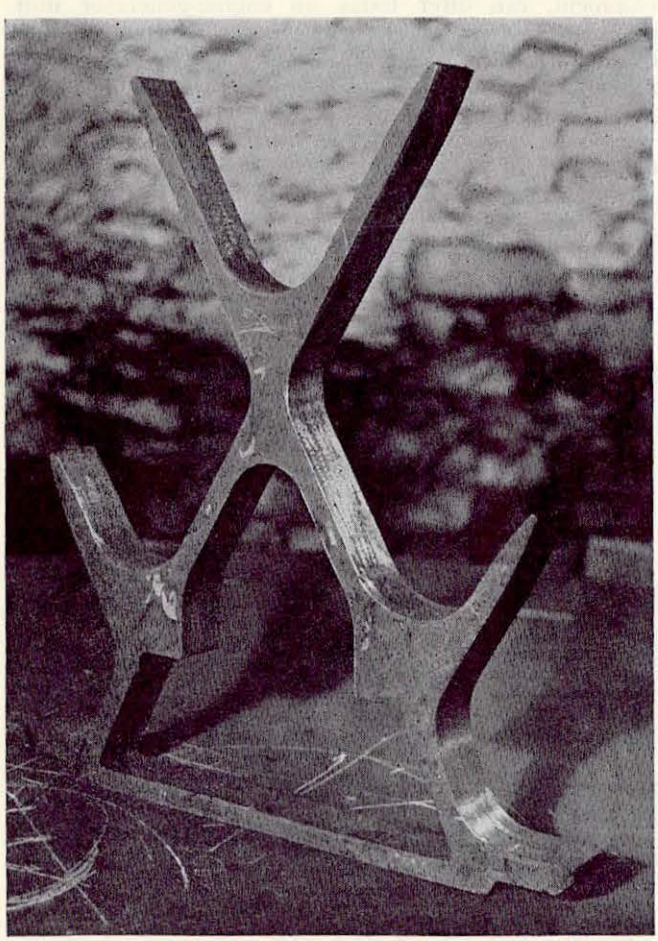


Fig. 5—A Flame-Cut Main Frame for a V-Type Crankcase

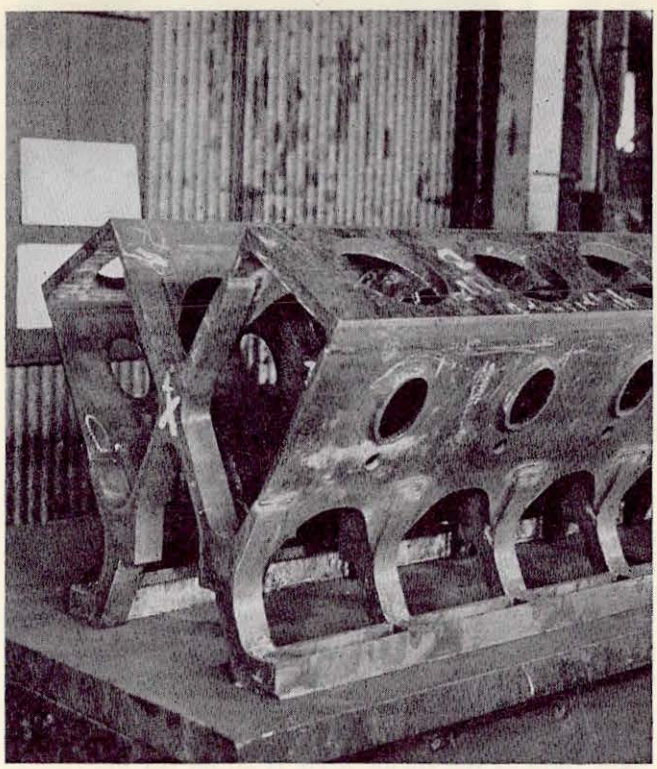


Fig. 6—The Partially Built Crankcase

Forms of Welded Crankcases

Early welded crankcases were of tie-rod construction, the welded steel case serving as a stabilizing medium for the tie rods. It is a common misconception that the tie rods take all the load. Tie rods, if they are screwed up and set properly by means of strain gages, bring into play the rigidity of the crankcase. The material which is compressed when the rods are screwed up adds its flexural rigidity to the flexural rigidity of the rod. It is just as important in the case of tie-rod construction to eliminate stress concentrations as it is in the case of an engine in which the gas load is carried entirely by a weld. The frame is subjected to the same alternations of stress, whether the tie rods are in place or not. The only condition under which the frame can be entirely relieved of stress occurs with loose tie rods.

The engines shown in Fig. 1 were built of low carbon welding quality steel with endurance values for an indefinitely repeated stress of 30,000 lb. per sq. in. The weld metal used to join the components had an endurance limit of 28,000 lb. per sq. in. established by rotating-beam test on all-weld-metal specimens. It was then a matter of eliminating all undercuts, unfused welded joints, and surface discontinuities of any type, since it is easy, at an average stress of 5,000 lb. per sq. in., to incorporate a stress factor of five or six, which would legislate against indefinite service life. The crankcases weigh about 5 lb. per hp.

Fig. 2 shows an installation of the same general type of crankcase with the exception that the engine is two

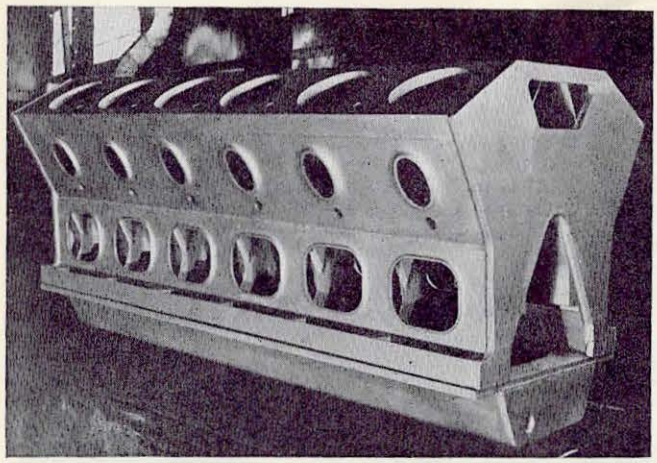


Fig. 7—The Completed Crankcase and Oil Pan

cycle and slight modifications were made in the case to take care of this feature. These engines form part of the Winton Engine Corporation's exhibit at the Century of Progress in Chicago, and have been in continuous operation since the opening of the fair, supplying power and light to the entire General Motors Building there. This installation, including generator and sub-base, has a specific weight ratio of 39 lb. per hp. The specific weight ratio of the engine itself is 20 lb. per hp.

To eliminate still more weight in steel crankcases the construction of a case was initiated in which the gas and inertia loads were carried entirely by the welded structure. With the tie-rod type of construction much material is not working effectively, especially if the tie rods are not set properly. In a completely welded unit better distribution of the stresses can be achieved because of the monolithic construction. An experimental single-cylinder frame was built embodying a main frame flame-cut from a plate of steele 2 in. thick. This model was subjected to strain-gage tests to determine the efficacy of the conception. Fig. 3 shows the main frame as cut out for the model test engine, and Fig. 4 shows the built-up single-cylinder unit. The main frame was joined by welding to the top deck, into which the cylinder-head studs were tapped. This frame showed satisfactory deflection and stress characteristics.

Based upon this experiment construction was undertaken of a 1,000-hp. twin-six engine in which the entire gas load was carried by the welds. Fig. 5 shows the type of flame-cut main frame which was used. This frame transmits the gas load of one bank of cylinders past the gas load of the other bank of cylinders and into the main bearings. The minimum weight design is one in which the material is loaded in straight tension. The flexibility of flame-cut steel plate in meeting this ideal condition is well illustrated by this frame member. The stub ends of the frame could not be run through to the top deck because the stagger of the connecting rods produced a 3-in. offset in each cylinder with respect to the cylinder in the other bank, which necessitated the use of a transition joint. Since the transition joint had a peculiar shape, more experimental work was done to determine an efficient design for the joint before proceeding with the engine. The experimental joint simulated the condition in the engine where the joint carries an impact load of 19,000 lb. The joint fractured outside the weld, through the plate, at a load of 212,000 lb.

Fig. 6 shows the crankcase partly finished. The top deck was welded to the transition plate with a single butt weld running the entire length of the engine on each side. The gas load of each cylinder is then carried through the butt weld at the top deck and through the two transition joints to the main bearings. The welds, including the transition joints, were radiographed to discover any imperfections, unfused joints or porosity that might have existed. The crankcase was also thoroughly inspected for undercuts and surface discontinuities. In the construction of two of these crankcases it was not necessary to chip and reweld any of the joints.

Fig. 7 shows the completed crankcase as it left the weld shop, mounted on the oil pan to illustrate the manner in which the oil pan forms the bottom tie for the complete case. Built in high strength, welding quality alloy steel, this crankcase has a weight of about 2.6 lb. per hp.

The entire engine is less than 10 lb. in weight per hp. running on the test block. Calculated from the indicator card, each weld in this structure is subjected to an impact load of 38,000 lb., occurring twelve times each second. The recently completed 300-hr. full-load run indicates that the frame has been subjected to a number of cycles of stress far beyond that necessary to establish the fact that the stress concentrations which undoubtedly exist in the frame are not large enough to raise the average stress above the endurance limit for the steel from which the frame is made.

Welded Crankcases for Railroad Service

Welded steel crankcases of the type discussed enable the engine builder to offer to the user of mobile prime movers a light-weight, highly efficient and powerful unit embodying all the advantages of the Diesel principle. The Winton Engine Corporation of Cleveland, Ohio, with which it has been a privilege to work in this development, can offer today an engine-generator unit supplying 750 kw. of electrical energy which, including all auxiliaries, will weigh 30 lb. per hp. Railroad vision has enabled immediate application of this notable prime mover to main-line service. Under construction today is a welded steel engine structure which will be used in the power unit of the Union Pacific System's 110-m.p.h. high-speed passenger train. The Chicago, Burlington & Quincy's high-speed passenger train will have, as its motive power, a 600-hp. Diesel engine of welded steel construction.

* * *

A Relief Map of Glacier National Park, a Map of the Burlington Lines, the Northern Pacific and The Great Northern and Names of the System's Famous Trains Are Features of the C. B. & Q. Exhibit at "A Century of Progress"

Blue Eagle Code Not Needed For Railroads

Eastman finds such procedure not wise, even if legally practicable

WASHINGTON, D. C.

JOSEPH B. EASTMAN, federal co-ordinator of transportation, on September 1 made public a memorandum he had prepared for the consideration of the President expressing the opinion that the adoption of a code for the railroads under the national industrial recovery act, as formally requested by the Railway Labor Executives' Association on August 18, would not be wise, even if it were legally practicable. As previously reported, this memorandum was sent by the President to A. F. Whitney, chairman of the labor executives' group, with a letter stating that while he was "largely in agreement" with Mr. Eastman's findings and that the railroads could not be put under the "Blue Eagle" he considered it desirable to apply the "principle" of the N. I. R. A. to railroads so far as possible. Mr. Eastman's memorandum also pointed out that there are situations which ought to be corrected where certain classes of railroad employees are working longer hours than are necessary in comparison with others and that informally he was taking steps to see whether these situations cannot voluntarily be corrected.

According to reports from Cleveland railroad labor leaders are planning to hold a meeting shortly to discuss plans for a movement to obtain a shorter working day, without reduction of wages, presumably by pressing for the enactment of six-hour day legislation such as they had proposed in the last session of Congress.

Mr. Eastman shows that it clearly was not the intention of Congress to include the railroads under the N. I. R. A., because it left unrepealed previous statutes covering their situation and also passed a separate law, the emergency transportation act, dealing with them. He also said that "there is no need for a 'code of fair competition'" for the railroads, which "are subject to more comprehensive public regulation than any other privately-owned industry in this country, if not in the world." He had seen no indications, he said, that railroad employees generally desire a shorter work day without an increase in hourly rates of pay and that it is both impracticable and undesirable for the railroads to increase their rates and revenues to meet an increase in wage expense. Co-ordinator Eastman's memorandum follows:

Two questions will be discussed:

1. Whether as a matter of law the N. I. R. A. is applicable to the railroads?
2. Whether as a matter of policy the N. I. R. A. should be applied to the railroads?

The Question of Law

With his letter of August 17 to the President, Chairman Whitney of the Railway Labor Executives' Association submitted a memorandum entitled "Jurisdiction and Power of the President under the National Industrial Recovery Act." It supports the proposition that under that act jurisdiction is vested in the President to establish and put into effect a code governing the relations of railroad companies and their employees, and gives reasons why this should be done. I have been supplied with another memorandum, a copy of which is submitted herewith, entitled "The Railroads and the National Industrial Recovery Act" and prepared by General Counsel Fletcher of the Association of Railway Executives. This supports the proposition that the railroads are not included in that act and, if they were, ought not to be dealt with under it.

Upon the question of law there are, therefore, two opposing memorandums prepared by vitally interested parties. If a decision upon this question is deemed important, it would seem appropriate to submit these memorandums to the Attorney General with a request for his opinion.

For what it may be worth, my own opinion is that the railroads are not included in the N. I. R. A. I base this opinion chiefly upon these considerations:

1. There is considerable evidence, as the general counsel of the Association of Railway Executives points out, that the Congress did not, when the N. I. R. A. was under consideration, regard its provisions as applicable to the railroads. The railroads were being dealt with contemporaneously in a separate Act. In the discussion of that act the question of a shorter work day for railroad employees came up very definitely, but no provision therefor was finally made.

2. Consideration of the provisions of the N. I. R. A. and of the language used therein supports the conclusion that it was not intended to apply to the railroads. For example, the codes are described throughout as "codes of fair competition," an apt description in the case of private, competitive industry but not in the case of a quasi-public industry, such as the railroads, already subjected to comprehensive and drastic public regulation. Violations of the "standard of fair competition," provided in the codes, are to be deemed an "unfair method of competition in commerce within the meaning of the Federal Trade Commission Act." The railroads, of course, have never been subject to that act, and are instead most elaborately provided by the Interstate Commerce Act with standards governing their activities. The provisions of the N. I. R. A. with respect to licenses are obviously inappropriate to the railroads, although most appropriate for private, competitive industry. Attention may also be called to the "Declaration of Policy" in section 1, which contains many references which have no application to the railroads, and to the title of the act with its words, "to foster fair competition." Clearly the act was designed to provide a measure of control for hitherto uncontrolled and unregulated private industry.

3. In the Emergency Railroad Transportation Act, 1933, passed and signed contemporaneously* with the N. I. R. A., it was clearly and emphatically provided that the wages and working conditions of railroad employees should remain subject to the Railway Labor Act, at least until the enactment of further transportation. legislation.

Section 10 closes with the following proviso:

Provided, however, that nothing herein shall be construed to repeal, amend, suspend, or modify any of the requirements of the Railway Labor Act or the duties and obligations imposed thereunder or through contracts entered into in accordance with the provisions of said Act.

Section 7(e) provides that carriers by railroad, whether under control of a judge, trustee, receiver, or private management, shall be required to comply with the provisions of the Railway Labor Act and with the provisions of certain paragraphs of the amendment to the Bankruptcy Act approved March 3, 1933. One of these paragraphs, which is thus made applicable to all railroads, reads as follows:

(o) No judge or trustee acting under this Act shall change the wages or working conditions of railroad employees, except in the manner prescribed in the Railroad Labor Act, or as set forth in the memorandum of agreement entered into in Chicago, Illinois, on January 31, 1932, between the executives of twenty-one standard labor organizations and the committee of nine authorized to represent Class I railroads.

However, the possibility of improvement in railroad labor conditions and relations was recognized, and therefore section 13 makes it the duty of the Federal Co-ordinator of Transportation "forthwith to investigate and consider means, not provided for in this title, of improving transportation conditions throughout the country, * * * including, also, the stability of rail-

*The railroad Act was, however, signed at 12.05 P.M., whereas the N I. R. A. was signed earlier at 11.55 A.M.

road labor employment and other improvements of railroad labor conditions and relations," with a view to submitting "such recommendations calling for further legislation to these ends as he may deem necessary or desirable in the public interest." Clearly the purpose was to make improvement of railroad labor conditions and relations the subject of future legislation, in the meantime providing definitely that wages and working conditions should be changed only in accordance with the procedure prescribed in the Railway Labor Act.

Section 7(a) of the N. I. R. A. provides that every code of fair competition, agreement, and license shall contain conditions giving employees the right of collective bargaining through representatives of their own choosing; freeing them from the interference, restraint, or coercion of employers in the designation of such representatives or in self-organization; and providing that they shall not be required as a condition of employment to join any company union or to refrain from joining, organizing, or assisting labor organizations of their own choosing.

Instead of relying upon the provisions in the N. I. R. A., the same subject was most comprehensively covered in the Emergency Railroad Transportation Act by reference to the following provisions (in addition to the one above quoted) in the Bankruptcy Act, which were made applicable to all railroads, however managed:

(p) No judge or trustee acting under this Act shall deny or in any way question the right of employees on the property under his jurisdiction to join the labor organization of their choice, and it shall be unlawful for any judge, trustee, or receiver to interfere in any way with the organization of employees, or to use the funds of the railroad under his jurisdiction, in maintaining so-called company unions, or to influence or coerce employees in an effort to induce them to join or remain members of such company unions.

(q) No judge, trustee, or receiver acting under this Act shall require any person seeking employment on the property under his jurisdiction to sign any contract or agreement promising to join or to refuse to join a labor organization; and if such contract has been enforced on the property prior to the property coming under the jurisdiction of said judge, trustee, or receiver, then the said judge, trustee, or receiver, as soon as the matter is called to his attention, shall notify the employees by an appropriate order that said contract has been discarded and is no longer binding on them in any way.

The Question of Policy

Assuming that a code for the railroads could lawfully be established under the N. I. R. A., would this be wise? Aside from wages and working conditions, there seems nothing which such a code could accomplish. The United States railroads are subject to more comprehensive public regulation than any other privately-owned industry in this country, if not in the world. There is no need for a "code of fair competition." The Interstate Commerce Act was originally enacted as much to control the competition of the railroads with each other as to prevent monopolistic extortion, and the emergency act has for one of its main purposes further control over such competition to avoid wastes incident thereto. Over-production of railroad facilities and service is prevented by the provisions of the Interstate Commerce Act which enable the commission to control new construction and to authorize the abandonment of lines no longer useful. The commission may bar the operation of anti-trust laws, both federal and state, to permit railroad consolidations and acquisitions of control and the pooling of traffic and service. The Co-ordinator is given even more extensive power to bar the operation of the anti-trust statutes. The issuance of railroad securities is also under complete public regulation.

A code for the railroads could, therefore, serve no useful purpose, outside the field of wages and working conditions. But in that field, also, the railroad situation is quite different from that which exists in other industries. The principle of collective bargaining has not only been recognized in practice for many years on the railroads, but it is recognized by law in the Railway Labor Act and a procedure prescribed therefor. As shown above, the Emergency Act was so drawn as to protect this procedure in every possible way, and at the instance of railroad labor. It is true that company unions exist on many railroads, for certain classes of employees, to the dissatisfaction of the so-called standard unions; but the Emergency Act, as above indicated, contains provisions to safeguard this situation.

There are several other acts designed for the protection of railroad employees. Safety is protected by the Safety Appliance and Boiler Inspection Acts. Hours of service are covered for train and engine employees by the Hours of Service Act. For these same employees the principle of the 8-hour day was established by the Adamson act, and this principle has since been voluntarily extended to most other railroad employees. Legislation proposing to establish the principle of a 6-hour day for railroad employees has been considered but not enacted, although the commission, by direction of Congress, made an elaborate report on this subject in December, 1932.

As a result of public regulation, railroad rates and charges have been protected during the depression against the reductions which commodity prices generally have suffered. There have been some reductions, forced by truck and waterway competition, but a very large body of railroad rates still stand at 50 per cent or more above the pre-war level. The same is true, very largely, of railroad hourly wage rates. The reduction from the peak has in most instances been no more than 10 per cent. It is true that railroad labor has suffered severely from dismissals or part-time employment, but similar conditions have prevailed in many other industries combined with a much larger reduction in hourly wage rates.

Statistics in regard to railroad wage rates, in comparison with those in industry generally, are given in the memorandum submitted herewith and prepared for the Association of Railway Executives. Without accepting these at face value, for I have not undertaken to check them, I call attention to a fact in connection with railroad wage rates which is of manifest importance in the present discussion. Acting under the Railway Labor Act, the railroad managements gave notice last June of an intention to make a large reduction in railroad wages. At the request of the President, I conferred with both sides in an effort to postpone this controversy, because of the disturbing effect which it might have upon the Administration's plans for reviving business. As a result, an agreement was reached under which existing wage rates (including the 10 per cent deduction) were definitely continued until June 30, 1934. This was hailed by the labor organizations as a victory.

So far as I am aware, there is comparatively little need in the railroad field for minimum wages, such as have been provided in the various codes adopted under the N. I. R. A. The main thing which it may be urged that a code for the railroads could do would be to spread work with a consequent increase in employment. There are many complexities incident to establishing a shorter work day for railroad employees, as is pointed out in the memorandum from the Association of Railway Executives. Disregarding these difficulties, however, could such a shorter work day be established without an increase in hourly rates of pay and consequent large increase in railroad operating expense?

I have seen no indications that railroad employees generally desire such a shorter work day without an increase in hourly rates of pay, and probably an increase sufficient to preserve their present daily earnings. In other industries, where an increase in operating expense has been caused in this way through codes or the President's Reemployment Agreement it is contemplated that some offsetting increase in prices may be made. Within reasonable bounds such action seems to be officially sanctioned. In the case of the railroads, however, this could not be done without the consent of an independent tribunal, the Interstate Commerce Commission.

Recently the commission has closed an investigation, instituted at the urgent demand of several of the great industries of the country, to determine whether or not a general reduction in railroad rates ought not to be ordered. By a vote of 7 to 3, the commission refused to order such a reduction, but the very fact that this investigation was had illustrates the situation with respect to railroad rates. They are still relatively very high, compared with commodity prices generally, and this marked disparity in level is held by many business men, and also economists, to be one of the important factors hampering a revival of trade and commerce. The desirable thing is to bring commodity prices up to the level of railroad rates, rather than to increase the latter, and there is a long distance to go before this result will be reached.

Not only would an increase in railroad rates and charges be subject to the consent of the Interstate Commerce Commission, but it would be of questionable advantage in any event, owing to the sharp competition which the railroads meet from motor trucks and water lines, where wages and working conditions are far less favorable to the employees than on the railroads.

Resumption of Railroad Buying Much to Be Desired

But if it is both impracticable and undesirable for the railroads to increase their rates and revenue to meet an increase in wage expense, what would be the situation if such an increase in expense were suffered without a compensating increase in revenue? A thing much to be desired under present conditions is that the railroads should be able to resume new construction and the purchase of new equipment, materials, and supplies. In prosperous times they are among the largest buyers in the country, and their comparative withdrawal from the markets is an important factor in the depression of the so-called heavy industries. Railroad credit is now practically non-existant, except so far as loans from the government are concerned, and the railroads are reluctant to borrow money even from the government. However, railroad earnings are improving, and credit conditions may soon be better. It is possible, therefore, to anticipate that in

the not remote future the railroads may be able to increase their purchases materially, with advantage to all concerned including railroad labor. But this hoped-for result might be indefinitely postponed if the railroads should experience a substantial increase in expense without compensating increase in revenue.

Under all of the circumstances I am of the opinion that the adoption of a code for the railroads under the N. I. R. A. would not be wise, even if it were legally practicable. In saying this, I do not mean that railroad labor conditions are all that they should be. In the memorandum from the Railway Labor Executives' Association it is stated that the railroads employ 1,750,000 in normal times and are now employing about 1,000,000, leaving 750,000 unemployed. This is, I think, an overstatement, for improvements in transportation methods make it improbable that anything like 750,000 would be re-employed even if traffic should be restored to 1929 proportions. There is a bad unemployment situation on the railroads, but the best hope for improvement lies in an increase in business activity which will add to the traffic and earnings of the railroads, enabling them not only to increase their train service but also to make up much deferred maintenance. Anything which would interfere with the improvement of railroad net earnings would also stand in the way of such a program of re-employment.

There are situations which ought to be corrected where certain classes of railroad employees are working longer hours than are necessary in comparison with others. Informally I am taking steps to see whether these situations cannot voluntarily be corrected, and am hopeful of favorable results. It may be possible, also, to provide for minimum wages consistent with those adopted in the codes, in the few instances where such minimum wages may be necessary.

In the above discussion I have not gone into one phase of the question which might be important from the labor standpoint. I understand that the codes so far adopted have gone no further than to fix minimum compensation and maximum hours per week, leaving wage rates to be fixed by collective bargaining. In the case of the railroads wage rates have been fixed by such bargaining, in definite agreements which do not expire until June 30, 1934. Either the code would leave these agreements unimpaired, thus preventing any increase in wage rates through collective bargaining to compensate for the shortening of hours, or they would strike down the agreements and leave many matters governed thereby in doubt and confusion. I do not know which result would follow, but presume it would be the first of these alternatives.

Eastman Asks Co-operation To Increase Employment

WASHINGTON, D. C.

A PROGRAM of suggestions as to methods by which railroads and their employees may co-operate to carry out the principle of the national industrial recovery act, despite the fact that it has been decided it does not apply directly to the railroads, has been sent by Co-ordinator Eastman to all steam railroad presidents and to the executives of the so-called standard railroad labor organizations, following conferences held last week with representatives of the roads and of the employees. Railroads are urged to use every available dollar, as traffic and revenue increase, to put more men to work, and to invite the employees, through their system representatives, to confer with the managements as soon as possible for the purpose of arriving at voluntary mutual agreements to equalize the available work by curtailing overtime, reducing the length of the work day to at least eight hours, discontinuing the practice of working seven days a week where it still exists, and reducing high or excessive mileage to mutually acceptable levels.

The suggestions were made in general terms, for temporary application during the emergency, and without endorsement of any particular length of work day or work week. It is understood that they were inspired in part by the formal request of the railway labor executives that the President place the railroads under the N. I. R. A. by prescribing a code for them and in part by numerous letters received by Mr. Eastman from railroad employees complaining that many of the men, particularly some of those retaining regular runs under their seniority rights, have been working excessive hours while others have been receiving little or no employment. Consequently he is asking some of the employees to share their work and earning with those who have had less opportunity, just as he had earlier requested the railroad executives to reduce their compensation. He said that while it was, perhaps, not strictly his official duty to bring these matters to the attention of the railroad managements and the employees, he had felt justified in doing so "because it seems that no one else may more appropriately take such action," and he had "reason to believe that such suggestions may be helpful to all concerned." Mr. Eastman said he would be glad to have a brief report from each railroad advising how and to what extent it has been found possible to comply with the suggestions.

"The President has decided that the railroads are not to be dealt with under the National Industrial Recovery Act," Mr. Eastman said. "They have, of course, been subjected for many years to more comprehensive regulation than any code provides. But the fact that they are not within the N. I. R. A. makes it all the more important that the railroads play their proper part in the program of national recovery.

"One thing for them to do, as I have heretofore indicated, is to use every available dollar, as traffic and revenue increase, to put more men to work. There is so much deferred maintenance and other work which sorely needs to be done that this will not only help the country but be the soundest of economy. Much has been done, I know, in this direction. I also call attention to the fact that money can now be borrowed on favorable terms from the Public Works Administration for railroad equipment and maintenance. Thus far no railroad has availed itself of this opportunity. Yet such expenditures are needed, and they would strengthen the recovery program at an important point. The railroads will not play their proper part if they neglect these opportunities.

"In another way the railroads and their employees can help. There has been much spreading of employment within reasonable limits, and the employees have on the whole been generous in responding to such efforts. But the situation is not as satisfactory as it might be. There are still many instances where employees are required or enabled to work hours or mileage quite in excess of accepted minimum standards. I refer to seven days work per week, hours exceeding eight per day, and monthly mileage accumulations of train and engine service employees out of proportion to what is reasonable under present conditions and fair to other employees.

"I know the many factors which enter into the various agreements governing the daily, weekly and monthly earnings of each class and craft of railroad employees, and the difficulties which may be met in further equalizing and division of available work. The suggestions which I shall make will, therefore, be couched in general terms, but I feel confident that they can be carried out in principle if the task is approached in the right spirit. They are offered only as suggestions appropriate to this period of national distress and emergency, and not as precedents necessarily to be observed when normal times return."

The suggestions are as follows:

First, That no hourly, daily or monthly employee be required

or permitted to work every day in the week. There may be isolated cases where it is impossible, because of continuous service requirements and remoteness of place of employment, to relieve a man regularly once a week. In such instances the result can be accomplished by working the employee a total minimum number of days per month straight through, equivalent to the total he would have worked had he been relieved regularly each week, and then replace him for the remainder of the month with a relief or swing man.

Second, That every effort be made to reduce overtime, whether at punitive or straight time rates. This will serve a dual purpose. It will produce economies in operation as well as increase employment. I urge every railroad to make a careful check of each situation where overtime is now being incurred, and endeavor to curtail it to the irreducible minimum. If, for example, the alternative is between two or three hours overtime each day for yard crews of a given terminal, and placing one additional engine and crew in service to clear up the daily work in each hours, the latter should be the choice, other things being equal.

Third, That where any hourly, daily or monthly employee, whether in supervisory capacity or otherwise, is now required or permitted to work more than eight hours per day, as a regular assignment, this situation should be changed. Every effort should be made to establish in fact at least an eight-hour day.

Fourth, That those employees in train and engine service who are still accumulating high monthly mileage agree to a reduction compatible with the minimum mileages specified in prevailing labor agreements, having in mind also such readjustments downward as have already been made by the other crafts in those services. It is not intended to suggest any definite or arbitrary mileage for train or engine service employees. The thought rather is to leave the determination of the maximum that may be accumulated under present conditions to each class of employees, their representatives, and the managements, with the help of such suggestions as each labor organization may make to its members.

All of the adjustments in hours per day, week or month, or in days per week, or in days or miles per month, above suggested, can only be accomplished by mutual agreement between the employees concerned and the railroad managements. I suggest, however, that the managements take the initiative and invite the employees, through their system representatives, to confer with them as soon as possible for the purpose of arriving at such agreements. It is not suggested that any voluntary agreement so negotiated be for a period longer than the prevailing unemployment emergency. Nor is it suggested that any class or craft of employees in any instance increase hours, days, or weeks worked, or the monthly mileages, above those now in effect by mutual agreement.

I wish to emphasize that my suggestions are not to be construed as an endorsement of any particular length of work day or work week for hourly, daily or monthly employees, nor as recognition of any particular number of miles per month as proper for engine and train service employees to accumulate under normal conditions. The suggestion is only that wherever employees work overtime, or more than eight hours per day or seven days per week, or run relatively high mileages per month, every effort be made under present conditions, in keeping with the spirit of the times, the provisions of the Railway Labor Act, and existing labor agreements, to curtail this overtime, reduce the length of the work day to at least eight hours, discontinue the practice of working seven days per week, and reduce high or excessive mileage to mutually acceptable levels.

In so far as the railroads and their employees co-operate to increase employment, whether it be by the expansion of repair or supply manufacture programs, or the reduction of time or mileage, it will be in keeping with the principles of national recovery which are now being followed. The National Industrial Recovery Act contemplates that each industry so readjust its hours and enlarge its operations as to reabsorb as many as possible of its unemployed workers. The steps which I have suggested for the railroad industry are in line with this principle.

Another important principle which has been recognized in the administration of the National Industrial Recovery Act aims at the increase of mass purchasing power. This is accomplished first by increased employment, and second by raising wage levels, more particularly in the lower brackets. Most railroad wage rates are governed by agreements between the railroad companies and labor organizations, and these may not be disturbed except by mutual consent. However, it appears that there are some employees in railroad service whose wage rates are not established by agreements with labor organizations, and that in some few instances these are receiving hourly or daily compensation below the hourly, daily and weekly minimums established for analogous work by the codes of fair competition approved by the President for other industries. I suggest that this is a situation to which the railroads may well give attention.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended August 26 totalled 631,998 cars, a decrease of 2,847 cars as compared with the preceding week but an increase of 94,231 cars as compared with the corresponding week of last year. This brought the cumulative loading for the year to date up to over 100,000 cars in excess of that for the corresponding period for 1932. As compared with 1931, however, the loading for the week was a reduction of 131,553 cars. Loading of grain and grain products, livestock, and coal showed increases over the preceding week and all commodities except livestock, grain, and l. c. l. merchandise showed increases as compared with the corresponding week of last year. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

Revenue Freight Car Loading

Week ended Saturday August 26, 1933

Districts	1933	1932	1931
Eastern	141,281	119,949	170,614
Allegheny	128,165	98,745	150,671
Pocahontas	49,012	36,820	49,172
Southern	83,746	79,022	105,059
Northwestern	94,189	70,414	111,564
Central Western	86,596	87,025	117,193
Southwestern	49,009	45,792	59,278
Total Western Districts	229,794	203,231	288,035
Total All Roads	631,998	537,767	763,551
Commodities			
Grain and Grain Products	28,677	37,971	40,220
Live Stock	18,725	19,188	24,317
Coal	129,624	94,688	134,488
Coke	6,368	2,880	4,868
Forest Products	26,644	16,608	28,026
Ore	37,366	7,210	34,927
Mdse. L. C. L.	168,507	171,076	214,591
Miscellaneous	216,087	188,146	282,114
August 26	631,998	537,767	763,551
August 19	634,845	518,440	748,600
August 12	622,759	511,965	743,626
August 5	613,112	496,626	734,730
July 29	638,396	511,103	761,818
Cumulative total, 34 weeks	18,219,171	18,105,322	25,035,724

Car Loading in Canada

Car loadings in Canada for the week ended August 26 totaled 41,887 cars, according to the compilation of the Dominion Bureau of Statistics. This was a decrease from the previous week's loadings of 1,294 cars, and reduced the index number from 71.48 to 68.32. It was, however, an increase over last year's loadings of 1,061 cars. All commodities showed increases over last year except merchandise and miscellaneous freight.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
August 26, 1933	41,887	19,525
August 19, 1933	43,181	18,796
August 12, 1933	38,644	19,141
August 27, 1932	40,826	16,332
Cumulative Totals for Canada:		
August 26, 1933	1,218,784	616,881
August 27, 1932	1,381,824	653,320
August 22, 1931	1,631,175	890,219

THE GERMAN RAILWAYS will supervise the recently-announced highway construction program in that country, according to reports received by the United States Department of Commerce. The program contemplates the construction of some 4,800 kilometers of highway, consisting of six main roads, two of which would traverse the country from north to south, three from east to west, and one in a diagonal northwest-southeast direction. The railway administration was placed in charge, the announcement states, because it was considered to be well equipped for carrying out the project, having trained engineers, surveyors, etc. The railway officer who has been charged with carrying out the program, it is further pointed out, has been given dictatorial powers regarding the entire work—the route the highways are to follow, the type of construction, etc.

R. A. O. A. Meets in Chicago

Accounting officers discuss many new problems—Pledge co-operation to Co-ordinator

THE Railway Accounting Officers Association held its forty-fifth annual meeting at the Stevens Hotel, Chicago, on August 30 and 31. Attendance totaled 495, of whom five were honorary members, 238 were members and the balance were guests. Officers for the ensuing year were chosen as follows: President, W. C. Carrick (general auditor, R. F. & P.); first vice-president, J. G. Livengood (comptroller, M-K-T), second vice-president, F. J. Fell, Jr. (vice-president, Penn.); secretary, E. R. Woodson (re-elected; is vice-president and comptroller of the Railroad Credit Corporation). The following were elected members of the executive committee: E. M. Thomas, comptroller, C. & O.; H. W. Johnson, comptroller, Burlington; G. J. Bunting, vice-president; I. C. White Sulphur Springs, Va., was chosen as the next place of meeting, the selection of the date being left to the executive committee.

In a resolution proposed during the closing proceedings by the incoming president W. C. Carrick, the association voted unanimously to assure Hon. Joseph B. Eastman, federal co-ordinator of transportation, of its desire to co-operate wholeheartedly with him in any way he might see fit to forward his efforts to improve transportation conditions in the public interest.

The discussions of the meeting were characterized by many indications of appreciation that rapid changes are occurring in the transportation business, that the accounting officers are alive to this situation and are prepared to bear their share of the task of effecting these changes. This attitude was especially marked in the address of President W. B. McKinstry (comptroller, I. C.) and it was also dwelt upon briefly by the incoming president, who stressed the possibilities open to the various committees of the association in furthering the efforts being made to simplify railroad tariffs, billings, etc., which simplification is necessary effectively to meet the competition of unregulated and under-regulated competitors of the railways. In addition to the presidential address, the opening session included in its program a comprehensive analysis of the railroad tax problem by E. C. Craig, general solicitor of the Illinois Central, who not only portrayed the situation but suggested methods for its amelioration. Abstracts of these addresses follow:

W. C. Carrick

J. G. Livengood

F. J. Fell

E. R. Woodson

President McKinstry's Address

In the world-wide readjustment that has been going on for the last few years, shocks have been transmitted here, there and everywhere. We have all been influenced thereby. Necessity being the mother of invention, we have studied in the University of Hard Knocks, and we have acquired knowledge and training that should stand us all in good stead. The efforts of governmental and industrial leaders to alleviate existing economic conditions deserve our sympathetic support.

The Railway Accounting Officers Association rightfully takes rank as one of the most important forces contributing to railway economy and efficiency. This we may record without sacrifice of our proverbial modesty, for we have the supporting testimony of many of our fellow railway officers on that point. The work of our members on their individual railroads has been advanced so far that nowadays they not only picture operating and financial results but also indicate unerringly the paths which must be followed in co-ordination, retrenchment and increase in output of service per man and per machine. The value of such information and such guidance throughout the passing emergency cannot be calculated in dollars and cents, but there is ample evidence of its beneficial effect in the continued efficient functioning of our relatively unimpaired national railway plant.

The work of this association in recent years has been timely and efficient and well in keeping with the purpose of its founders. Since the inception of The Railroad Credit Corporation, for example, it has been the pleasure and privilege of this association to collaborate with that corporation in its difficult task of administering the Marshalling and Distributing Plan, 1931. It was a task regarded by many in the beginning as impossible, but under the guidance of the able and distinguished president, of the Credit Corporation, E. G. Buckland, and its vice-president, E. R. Woodson, the complicated job was done so efficiently as to appear simple and easy. The success of the Credit Corporation is a tribute to railway co-operation.

This association has established a reputation for efficiently and comprehensively handling a large number of subjects at each annual meeting. A contributing factor to that end is the

compilation of the Agenda. Through its advance distribution, the members are enabled to study the various subjects and to come to the meeting prepared to act on the various matters which are up for consideration.

With pride and pleasure, I commend the splendid work performed during the year by the various standing committees of the association. The committee reports tell their own story, but not always is a report to be regarded as the sole measure of the service rendered. This is particularly true of so useful and helpful committee as the Committee on General Accounts.

Simplification of Freight Accounts

As usual, the Committee on Freight Accounts has handled a number of difficult subjects, but freight accounting officers are accustomed to meeting and overcoming difficulties. Perhaps the outstanding recommendation of that committee is the proposed adoption of a mandatory unit correction account form for use in adjusting unit items, such as single abstract entries, abstract totals or errors in division statements. Changes in mandatory rules and forms are not to be made casually, and that means thorough consideration should be given to all such suggestions. In tune with the times, the keynote of the committee's recommendations is economy. The subject of the reduction in size of forms is receiving attention, with the suggested action of a further review of all mandatory and recommendatory forms now in use. The report of the committee includes the adoption of some new forms and a revision of some of the present forms. The details inherent in freight accounting give to that branch an appearance of somewhat forbidding complexity, and therefore the advances made in the direction of simplicity and economy augur well for the future.

The Committee on Motor Bus, Truck and Air Transportation Accounts has been engaged on a proposed uniform system of accounts for motor vehicle carriers. It is understood that a complete draft has already been written. This committee, newly created, has been confronted with a volume of work requiring much time and effort. There are other committees that have contributed to the advancement of railway accounting, and they too deserve their meed of praise. The 223 pages of data now before you tell the story of the various committee activities.

I wish at this time to express my appreciation of the services rendered to me, as president, and to the association by our secretary, E. R. Woodson, and our assistant secretary, E. R. Ford, and members of their staff. Mr. Woodson, because of his unusual qualifications, has been able to do some exceptional work during the past year on behalf of the railroads and of this association.

Railroads Can Hold Their Own if Treated Fairly

The regulation of motor buses and motor trucks is still an active subject of discussion. There are well-supported complaints concerning inadequate or ineffective control of highway transportation. It has been urged that highway and railway transportation be placed upon a basis of equality of opportunity. Where the public highways are used as a place of business, it is urged, the payment of adequate taxes and fees should be required. Under equality of regulation and taxation, the railroads may be expected to give a good account of themselves. In the meantime, however, the railroads need to be even more aggressive than they have been in their efforts to forestall loss of traffic.

The report to Congress of the Shannon Committee on government competition with private business recommends "that the service of the Federal Barge Line, conducted by the Inland Waterways Corporation, should be discontinued and liquidated by sale to private enterprise." This is another timely movement which we can actively get behind.

When the Emergency Railroad Act was passed and Hon. Joseph B. Eastman was appointed Federal Co-ordinator of Transportation, I extended to him the services and assistance of the Railway Accounting Officers Association. It is the desire and the purpose of the association to be helpful to him in every possible way. The association should go definitely on record to that effect. No one knows better than we do the vital necessity of improving railway conditions.

E. C. Craig Discusses Taxes

The problem of railroad taxation is one of the most pressing problems facing the railroad managements, yet it is one of the most difficult problems and at times seems so hopeless as to engender a pessimistic attitude. During the period of the depression the railroad managements, seeing their revenues decline more than 50 per cent have, by the most drastic and sometimes heartrending economies, made proportionate reductions in all classes of expenditures covered under the general heading "Railway Operating Expenses". But the executives have been unable to make proportionate reductions in two classes of expenditures: taxes and fixed charges. These two problems must be solved before railroads can emerge into a period of normal and safe activity.

Railroad taxes have grown much faster than railroad revenues. In 1890 taxes consumed 2.83 per cent of gross operating revenues; in 1910, 3.49 per cent; in 1920 4.58 per cent; in 1930 6.61 per cent and in 1932 over 8.8 per cent.

The amount of taxation that can be borne by any industry varies according to the particular situation of that industry. The tobacco industry, for example, can and does, bear a load of taxation which seems enormous in comparison with the cost of the manufacture of the finished product. The reason is that the burden of tobacco taxes can be spread and enforced evenly throughout the entire industry without causing any competitive problems. The price of the finished product can be raised whenever necessary to take care of the taxes imposed. The product which railroads have to sell is transportation. The price at which transportation can be sold is fixed within certain limits by many conditions among which are competition with other forms of transportation on the one hand, and the economic needs of the public as voiced through the Interstate Commerce Commission on the other.

Tax Reduction Imperative

With an operating ratio which is now more than 80 per cent and with a tax burden of approximately 9 per cent the remaining 11 per cent is not enough to provide for fixed charges and return on investment even with the most drastic readjustment of fixed charges and scaling down of investment which may reasonably be expected. The burden of railroad taxation must be reduced substantially if the industry is to survive.

When we consider the problem of reducing railroad taxes to the great extent necessary to afford railroads the relief they must have, we must consider somewhat in detail the means by which the taxes imposed on railroads are determined. Federal taxes are almost entirely based on net income. They reached a maximum in 1926. In that year more than one-fourth of the total railroad tax burden consisted of the federal tax. The federal tax has been reduced so that it was $90,000,000 in 1921, $41,000,000 in 1930 and only $10,000,000 in 1931. It was, of course even less in 1932. Therefore, the railroad tax burden, so far as federal taxes are concerned, is, for the time being, solved.

When we consider the entire tax burden of railroads we find that there has been a reduction of about 25 per cent from 1926 to 1931, but the entire amount of this reduction was in the federal income tax. State and local taxes imposed on railroads for 1931 were greater in amount than the state and local taxes imposed in 1926. The maximum amount of the state and local taxes on railroads was reached in 1930. The reduction in state and local taxes for 1931 was less than 5 per cent. It is estimated that state and local taxes on railroads for 1932 were only about 10 per cent less than in 1931. It is clear, therefore, that the burden of state and local taxation on railroads has not yielded to change in circumstances in proportion to the necessities of the situation.

Kinds of Taxation

State and local taxation on railroads may be divided roughly into three general kinds: (1) The general property tax basis on valuation by assessors in each state. A large majority of the states tax railroads on the general property tax basis. (2) The tax on gross income.

A third method of taxing railroads is that in use in some of the Northeastern states, whereby the railroads are taxed on some rigid basis like that in Pennsylvania where the tax is based upon the amount of their debts. There are also subsidiary railroad taxes in many states, such as franchise taxes, as in Illinois, Missouri, Alabama, Mississippi and Louisiana; and net income taxes, as in Mississippi; and privilege taxes or other excise taxes; the amount of these supplementary taxes is comparatively negligible. Franchise taxes, net income taxes and other excise taxes are never imposed on railroads alone. Franchise taxes are applied to all corporations. Net income taxes are applied to all individuals or to all corporations. Railroads are not singled out for discriminatory treatment. We have nothing to complain of and little to fear from taxes of this kind. The great bulk of the railroad tax burden for state and local purposes is based on the general property tax on the ad valorem basis.

The problem of railroad taxation is, therefore, narrowed down to the question: How can we secure a reduction in our ad valorem

taxes? I suggest that this problem should be attacked in three ways which may be summarized as follows:

1. We should intensify our efforts to secure reductions in assessed value of our properties.

2. We should intensify our efforts to secure reductions in the rates of taxation imposed on property in general.

3. We should encourage the reduction of ad valorem taxation in general by the substitution of other methods of taxation such as the sales tax under which railroads will contribute a smaller proportion of the total revenue raised.

I hope I may be pardoned for telling the results obtained by the Illinois Central by vigorous action in demanding reductions in its ad valorem assessment in the states in which we are most concerned. In 1929 the total Illinois Central state and local taxes were in round numbers $11,000,000 of which over $4,500,000 was paid in Illinois, and a little over $3,000,000 to Mississippi. Most of our Illinois tax was, of course, due to our special charter provision by virtue of which we pay 7 per cent of our gross earnings on the charter lines in lieu of all other taxation, but we have over 1,400 miles of road in Illinois which are taxed in the ordinary way, and are not subject to the special charter provisions. The tracks were assessed at approximately $50,000,000. In our opinion the actual value of these tracks was about $75,000,000 and the assessment was made on the actual basis of 60 per cent of full value. Careful investigation developed the fact that property in general throughout Illinois was not assessed on the basis of 60 per cent of its value, but that the average level of assessment in 1929 was approximately 37 per cent.

Tax Equalization

We, therefore, determined to seek the aid of the federal courts to secure equalization of our assessment at 37 per cent instead of 60 per cent, and filed suit in the federal court to enjoin the collection of more than two-thirds of the taxes which were demanded by the state, counties and municipalities. As a result, our assessment was reduced from $50,000,000 to less than $39,000,000, a reduction of 23 per cent. In 1932 we demanded a further reduction of 15 per cent which was granted. The net result of this action in Illinois has been that the total assessment of the Illinois Central properties in this state has been reduced from $49,587,000 in 1928 to $32,893,000 in 1932, a reduction of 32⅔ per cent.

In the states where there has been no resort to the courts our experience has been varied. In Indiana, for example, the Tax Commission seems to have been very reasonable and has granted railroads reductions during the last three years totalling about 24 per cent. There have been reductions in the tax rates in Indiana so that the total reductions in taxes paid by railroads in Indiana during the last three years was nearly 50 per cent. On the other hand, states such as Iowa, Wisconsin, Nebraska and South Dakota have granted the railroads only small reductions. The courts continue to hold, as they have always held, that in valuing railroad property for taxation predominant consideration must be given to the earnings of the property averaged over a period of about five years, and to the current market value of stocks and bonds. The courts never have allowed much weight to be given in tax cases to the so-called reproduction value of property.

The net result of the Illinois Central's efforts to reduce its taxes is that our state and local taxes have been reduced from $11,003,958 in 1929 to $7,478,170 in 1930, a reduction of over thirty per cent, whereas the general average of all railroads in the United States shows a reduction in the same period of less than 15 per cent.

Taxpayers Associations Deserve Encouragement

The next method of securing tax relief is with relation to the tax rates. Nothing is accomplished where a reduction in the assessment is offset by an increase in rates. In some states there have been not only reductions in assessments but reductions in rates also, notably in Indiana. There we have secured a reduction of 24 per cent in assessment but a reduction of 47 per cent in taxes. This reduction in rates has been very largely due to the persistent and intelligent work done by the Indiana Taxpayers Association.

This association is, in my opinion, a model of its kind. It fights excessive expenditures all along the line. It has committees and local agents in every county in the state. In other states taxpayers have often found themselves saddled with onerous taxes to pay for bond issues which were imposed upon them almost before they realized what was being done. But the Indiana Taxpayers Association sees to it in that state that every proposed bond issue and every proposition for additional public expenditures, whether by the state or by counties, municipalities or small districts is immediately given glaring publicity and the opposition is organized. Similar associations have been organized recently in several other states and in some instances have produced noteworthy results, but most of the associations have not yet had time to demonstrate their efficiency. In my opinion, railroads should lend their active support to all such associations which are able to show their efficiency and freedom from political influences.

Real Estate and Farms Are Overtaxed

Finally, a reduction in our ad valorem taxes should be sought through the replacement thereof by other sources of taxation. The ad valorem tax bears most heavily upon owners of real estate, particularly farmers and railroads, and the owners of homes. Farmers and home owners everywhere are groaning under the burden of taxes which they have allowed to be imposed upon them. Railroad property is mainly real estate spread out over the face of the country where it cannot be concealed, but must bear its full share of the real estate tax burden. In most other countries, such as England, France and Germany, the great majority of their public revenues are raised by excise taxes of various kinds. This country has doubtless reached the state where it is clear that real estate taxes generally must be reduced, and the necessary public revenues must be raised in lieu thereof by various kinds of excise taxes such as sales taxes, gross income taxes and taxes on luxuries. I think that railroads should do their part in encouraging the development of new kinds of taxation to take the place of the ad valorem taxes.

Moreover, instead of the present practice of collecting taxes from the few who pay ad valorem taxes on real estate, the imposition of excise taxes generally among the people would make them "tax conscious" and would tend to bring about a more careful expenditure of public funds. For this additional reason it would be helpful to railroads.

Committee Reports

The Committee on General Accounts (T. F. Darden, vice-president, A. C. L., chairman) reported on 16 subjects and the discussion was unusually brief and uneventful. Two changes were made in the report from that shown in the printed agenda—one on the matter of simplification of accounting and statistics, upon which the committee decided to "continue the subject on its docket" instead of, as the agenda had it, stating that it would "submit its report later." The other had to do with a refund of income taxes by the Railroad Credit Corporation. Whereas, in the printed agenda, the committee recommended that no income tax adjustments be made after March 15, 1935, it now holds that none should be made after the end of the current year. At the open meeting of this committee on the day prior to the convention E. I. Lewis, director of the Bureau of Valuation of the Interstate Commerce Commission, appeared and expressed a desire to co-operate with the railroads in reducing required reports to the minimum. He also said, however, that, in spite of the complaints as to present requirements, many railroads were even now submitting considerable information which was not required of them.

Some fireworks developed during the presentation of the report of the Committee on Freight Accounts which was presented by Chairman H. V. Clemens (assistant general auditor, N. Y., N. H. & H.). The committee held steadfast to a previous opinion that interline adjustments arising from the milling in transit privilege should be made through overcharge claims channels. G. E. Bissonnet (general auditor, U. P.) asked the reason for this recommendation, and the committee's answer was that the originating lines do not know the actions of the transit lines; that the transit tariffs are individual ones to which originating carriers are not parties.

Mr. Bissonnet said that handling such matters through overcharge channels complicated matters and led to cor-

respondence. However, he did not press the point further.

Simplifying Interline Division Statement

Another question upon which this committee reported which occasioned heated discussion had to do with the statement of interline divisions. The committee recommended the simplification of this statement by the elimination of some of the information which it now shows. Objection was raised to this on the ground that this report offers a convenient source for many required statistics, as well as for special studies asked for from time to time. The point was made that all this information is available from the abstracts whence the division statement is compiled. Countering this, some protagonists of the division statement said that, while the abstracts would serve all right for companies using punch card accounting, other smaller carriers not using this method could derive the desired information from the abstracts only at considerable expense.

Chairman Clemens asserted that the committee had been actuated by the desire to eliminate duplication and to promote the greatest good to the greatest number; hence it favored simplifying the division statement. Moreover, he said, the committee would likely, next year, propose still further modifications in this direction. After considerable debate, the convention decided to accept the committee's recommendations.

The committee changed its report, as shown in the agenda, to give its opinion later on the matter of telegraphic advice to consignors when consignees fail to accept delivery and recommended that this duty, and the $1 tariff charge, be assigned to the destination road haul carrier. The Committee on Terminal Companies' Accounts also had this subject before it, as did the Overcharge Committee, the decision being favorable to the recommendation of the Freight Committee. On the matter of the time limit for readjustment of interline accounts, as shown in the agenda, the Committee rescinded its recommendations and asked that the matter be left with it for further consideration. With one or two other minor changes the report was adopted as previously published. Indicative of some of the problems which face the committee in future was the subject of accounting for store-door collection and delivery service, now "rapidly coming to the front", which it has already discussed at length and which is docketed for further study.

The report of the Committee on Passenger Accounts was presented by Chairman A. R. Wood (auditor, St. L.-S. W.) and reflected the complicated problems which have arisen for the accounting departments to solve because of the new forms of passenger rates and service now being offered by the railroads. No less than five of the 21 subjects submitted to this committee had to do with questions arising from the provision by the western railroads of interchangeable script coupon books. Another question, a very involved one, arose from the handling of passengers' automobiles in freight cars, which traffic, according to the proposition put to the committee, now involves an "excessive number" of such vehicles. Still another question had to do with new classes of passenger rates—Civilian Conservation Corps, Coach, Extension of Limit on Account of Illness, Intermediate, Popular Excursion and Week-End Excursion.

Disbursement Committee Studies Machine Methods

A. W. Lavidge, auditor of expenditures of the Burlington, in presenting the report of the Committee on Disbursement Accounts of which he is chairman, commented upon the report of this committee in part as follows:

The necessity for economy in handling our work, as you know, has been brought very forcibly before us in the past several years. Many of the roads have re-organized part of their disbursement work by consolidating work which was heretofore done in so-called division offices into district, departmental or general offices. These changes have resulted in substantial savings, and I believe in most cases have been made after carefully considering the matter to see that the company's interests from an auditing standpoint are fully protected.

With the thought in mind of both economy and protection of the company's interests, I should like to call your attention to several things which I believe are worthy of consideration:

Subject No. 1 on this year's docket of the Disbursement Committee, "Use of Accounting Machines in Disbursement Work." In this subject are outlines of plans for use of machines in certain classes of disbursement work which are in addition to plans outlined in the disbursement committee's reports shown in the Railway Accounting Officers Association's forty-seventh and forty-eighth reports.

All of the plans outlined in the disbursement committee's reports have been tried by various roads and found to be successful and economical as compared with the methods previously followed. They are based upon actual application of the work on machines and therefore fit the requirements of roads following these plans. However, the committee in this report has endeavored only to give an outline of the plans so as to show in a general way what work is being handled on machines and the methods followed.

It is, of course, true that officers of different railroads require different kinds of statistics to assist them in their management, which makes conditions different on various roads, and these conditions must be considered in attempting to apply any plan outlined in the disbursement committee's reports to requirements of another road.

It has not been the idea of the disbursement committee to advocate the use of any particular machine, but to make available plans which have been found to be successful as will be shown from the fact that plans have been outlined in the various reports of the disbursement committee for handling the same classes of work on different kinds of machines.

The particular road's organization; that is, whether they have division accounting, district accounting, or a centralized accounting office; also, the volume of work and the requirements of the individual road for statistical data, all have a very vital part in determining what methods and machines might be used the most economically. On statistical work, I believe it generally follows that where the breakdown required is greater a larger saving can be made through the use of machines.

It has been my experience that the installation of machines on any class of work requires a great deal of study on the part of those responsible for the work prior to the installation of machines, to determine whether the plan is practical and feasible, and further that the greatest success is obtained through following the matter up closely after the installation is made. This takes a great deal of time and effort, but following it up in this manner generally assures success of the plan, and makes possible further improvements and short-cuts in handling the work.

The Committee feels that this matter is of such importance that the subject should be continued on its docket so that additional plans, and improvements in existing plans, may be submitted next year.

Joint Facility Bills

Another way in which I believe the accounting department might be helpful in reducing operating expenses is through their earnest co-operation with their operating department in the simplification of joint facility bills. Most joint facility contracts provide that maintenance and operating expenses of the facility be apportioned on the basis of use, expressed in terms of cars or car mileage. This necessitates keeping a record of costs which is very difficult to do and requires considerable checking on the part of the operating carrier to assure itself that all costs are included, and checking by the tenant to assure itself that costs not applicable to the facility involved are not included. The costs considered are then only the cash outlay.

If agreements could be reached among railroads for the use of others' facilities, upon either a flat rental basis or a rate per train or per car, which is equitable in protecting both the lessee and the lessor, a substantial saving could be made in accounting expense.

The committee changed its recommendation as shown

in the agenda with regard to the account to which should be charged expenses for completing delivery of freight by motor vehicle, namely to provide that such expenses should be charged to the appropriate revenue account, since there is as yet no account under the classification of operating expenses to which such disbursements may be charged. The question arose as to what account should be charged the special levy on the railroads designed to meet the expenses incurred by the federal co-ordinator of transportation; answer, Account 532, Railway Tax Accruals. The committee also reported on one further subject beyond that shown in the agenda, i.e., it favors the extension of the use of the simplified invoice, R.A.O.A. Standard Form 201. Director Lockwood of the Purchases Section of the staff of the federal co-ordinator of transportation, who was present, was asked to speak upon this invoice which he did, favoring it heartily.

Co-ordinator Wishes to Work with Existing Organizations

He also stated that the co-ordinator's office is interested not only in the simplified invoice but also in the simplification and standardization of materials themselves. He said that the co-operation of Divisions IV, V and VI of the American Railway Association had already been tendered the purchases section of the co-ordinator's office and that he felt that such co-operation was most important. He mentioned the efforts being made in the development of the new 50-ton standard box car and stressed the fact that it was the desire of the co-ordinator's office to help existing railway organizations to do the desirable things they had in mind, but had not as yet been able to accomplish, rather than, primarily, to evolve entirely novel ideas for the improvement of this branch of railway activity to the neglect of good ideas already put forward.

The Committee of Terminal Companies' Accounts, which had held no meetings during the year, met the day prior to the convention and reported upon the several subjects referred to it. On one subject already referred to above in the report of the Committee on Freight Accounts its views were at variance with those of the Freight Committee, and the views of the latter were adopted.

Another subject, that of the proper charge for a switching movement of refuse from repairs or additions and betterments was referred to the Committee on Disbursements. This committee's report was presented by James Davies, its chairman, who is general auditor of the Alton & Southern.

H. C. Holzbach, auditor of freight accounts of the Burlington, presented the customarily comprehensive report of the Committee on Overcharge Claims in the absence, due to illness, of Chairman Larson. The members of this committee, to judge from the report, as well as the supplementary paper on prevention of claims prepared by J. S. Fox, auditor of overcharge claims of the C. & N. W., are alert to the public relations aspect of claims prevention and are impressed with the importance of careful handling of such questions in meeting the competition of other forms of transportation. On a question of a modification in Overcharge Rule 38 (c) dealing with transit adjustments, the committee rescinded its recommendations as shown in the agenda and asked that the matter be permitted to remain with it for further consideration.

G. E. Bissonnet told of the work of the sub-committee which is preparing a classification of accounts for bus lines, stating that simplification beyond that so far achieved was desirable. Definite recommendations on this subject will be announced later.

Honorary Members

In the report of the Executive Committee the following were proposed for honorary memberships in the association and, by the adoption of committee's report, were admitted as such: A. L. Genzmer, former auditor, B. R. & P.; C. H. Poumairat, former auditor of passenger receipts, B. & O.; A. W. Martenstein, former auditor of disbursements, C. & O.; W. H. Wilson, former comptroller, N. & W.

Eastman and Buckland Welcome Co-operation

Co-ordinator Eastman and President Buckland of the Railroad Credit Corporation sent communications to the association. Mr. Eastman's message read in part as follows:

I regret that I am unable to accept your cordial invitation to attend the annual meeting of the Railway Accounting Officers Association. Please extend to the association my best wishes for an enjoyable and successful meeting. In connection with my new work I am sure that I shall receive the friendly co-operation of the accounting officers and it is not unlikely that I may have some accounting problems to put up to them.

Mr. Buckland, in his letter, said among other things, the following:

I very much regret that I shall not be able to be with you on this occasion, and in this connection I wish to express to you and to the members of the Railway Accounting Officers Association, the appreciation of the Railroad Credit Corporation—first, for the very great help given to it through the Association's lending to us Mr. Woodson, your secretary, who has rendered most valuable services as our vice-president and comptroller. Second, I am sure I also am expressing his sentiments in saying how much the work of the Railroad Credit Corporation has been facilitated by the hearty co-operation on the part of the accounting officers of the American railroads in putting into effect and administering the Marshalling and Distributing Plan of 1931. It is the hope of the directors and officers of that corporation that with the continued good will and assistance of the railway accounting officers, it will be able in the next few years of liquidation, to demonstrate in a substantial financial way, a large measure of success in carrying out the unique experiment embodied in the Marshalling and Distributing Plan of 1931.

New Book . . .

Public and Private Operation of Railways in Brazil, by Julian Smith Duncan. 243 pages, 8¾ in. by 6 in. Bound in cloth. Illustrated with map. Published by the Columbia University Press, New York. Price $3.75.

This study traces from their beginnings the development of Brazilian railways, showing how circumstances have dictated shifts in the government's railway policy which initially provided subsidies to private capital for construction and operation but later brought the government into the picture as the owner and operator of railway lines. As he recounts the circumstances surrounding several of these transfers from private to government ownership the typical story told by the author is one of financial difficulties, often accentuated by a depreciating currency. The net result, he points out, is that private capital has remained the owner and operator of the profitable lines while unprofitable lines, with two exceptions, have reverted to the government.

With the foregoing historical survey of Brazilian imperial and federal government railway policies completed, the book proceeds to "before and after" comparisons of roads which have changed their type of operation; comparisons of privately-owned and operated railways with both federal-government and state-government lines; and finally comparisons of certain state and federal government operating policies and practices with those of private companies. The appendix is a 54-page compilation of Brazilian railway statistics.

A Communication . . .

Railroads Suffer from Lack of Advertising Ability

Brooklyn, New York.

To the Editor:

Why do people prefer to travel by bus from New York to Chicago and return for $25, when for practically the same price they can take a train? Why do misinformed writers who don't know a firebox from a hot journal persist in grinding out articles which solve the whole railroad problem by the simple process of lambasting the technique of railroading? Why does the average citizen shrug his shoulders at the financial plight of the railroads with the conclusion that they are done for, and yet groan to high heaven about his tax burden?

These, and many other similar questions, can hardly be answered by a single proposition. Yet I believe that one of the biggest factors in their existence is the outmoded, stupid public relations policy of railroads in general. First of all, look at the current advertisements in New York City papers for the Chicago round trips. They are dull, flat and stale. The only thing they succeed in playing up is the very thing on which their bus competitors can beat them. True, they add a word about safety and comfort, but what company offering any kind of ox-cart "service" between the two cities wouldn't? Do the railroads' advertisements bring home the fact that passengers are safer on a train than on their own sidewalks? Do they explain why those passengers are safer? Do they cleverly call attention to the downright torture of sitting for 28 or 30 hours in a twelve-inch seat with your knees against the neck of the man ahead of you, and your head in the lap of the man behind you? Do they point out that we're all human, and that human beings are apt to miss toilet facilities to an embarrassing degree?

I am not unaware of the clever copy the Chesapeake & Ohio is now printing, and of the high-toned advertising of the Baltimore & Ohio a few years ago. Unfortunately both damn their rail competitors as much as they do any other. But most railroad advertising is not interesting, and most of the interesting things that should be advertised we never see.

This state of affairs seems due to the fact that railroads have the notion that people already know all about them. Nothing could be farther from the truth. The average man knows a railroad uses tracks, engines and cars, and maybe that it pays its engineers pretty well. But does he know what those tracks, cars and engines mean to him in safe, efficient transportation? Everyone knows that car and locomotive wheels are flanged, but does anyone properly realize what the combination of flanged wheels and steel rails contributes to safety? The railroads have more real things to sell the people and have more interesting things to tell the people than nine-tenths of the advertisers today. If a certain tea company finds it profitable to ballyhoo the new virtues of a tea that is no doubt exactly like its teas of years ago, if countless other manufacturers can whoop up dubious or non-existent virtues and make them pay handsomely, why cannot the railroads capitalize on their very real merits?

Aside from the matter of immediate profits, public good-will and understanding certainly need cultivation. At least 99 persons in every 100 would be astonished to know that, dollar for dollar, railroad transportation is the most economical transportation in existence. How are they going to find out about it and other such facts if the railroads don't tell them? At present our good citizens shake their heads over articles which haul railroad officials on the coals for not keeping in step with the times, forgetting that they themselves are using hopelessly outmoded radios which cost them four times as much as would better ones today.

There are a thousand-and-one facts and details about railroading crying for the right kind of publicity. And it is an almost sure bet that if they are dug up and presented to the public in an arresting and interesting fashion they will be read. I am not an advertising man; I believe little or none of the advertising directed at the public. But I am convinced of its tremendous efficacy, and I believe the railroad business stands to profit enormously by an intelligent use of it.

G. H. Burck.

Odds and Ends . . .

Better Late Than Never

Among the 1,284 Atlantic Coast Line employees and their friends who traveled from Waycross, Ga., to Albany for the annual A. C. L. outing recently, no one was more excited than Mrs. Sarah Shuman who, on this occasion was making her first trip on a railroad train. Mrs. Shuman, who is 79 years of age, had never seen the inside of a railway coach until the morning she boarded one of the two special trains.

The Absent-Minded British

No less than 2,500 sets of false teeth are left in the trains of the Southern Railway in England each year, according to a report from across the Atlantic. We prefer to think that these were merely put aside and forgotten by absent-minded passengers and not shaken out of their mouths by rough starts and stops inflicted upon the helpless travelers by brutal locomotive engineers such as are to be found on some trains in this country.

The Cashman Brothers

The Renovo division of the Pennsylvania boasts three brothers, all active or retired locomotive engineers, each of whom has completed 50 years of continuous railway service. In presenting the gold service decoration recently to Maurice Cashman, one of the brothers, E. B. John, superintendent of the division, recalled that five years ago he had given a similar decoration to John Cashman and three years ago, to another brother, David Cashman. John and David Cashman, now 71 and 70 years of age, respectively, have since retired on pension, but the latest recipient of the gold button is only 64 and is still in active service. Making the family service record still more impressive is the fact that Michael Cashman, father of the three brothers, himself served the Pennsylvania for 40 years on the same division, most of the time as track foreman and supervisor at Driftwood, Pa.

What Railroad Could Do More?

There seems to be no limit to the desire of the Long Island to gratify the slightest wish of its customers. An indication of this is to be found in the announcement that the railroad has just added to its Wednesday, Saturday and Sunday excursion trains, returning to New York from Montauk and Greenport, a convenience for fishermen which, to our knowledge, is unparalleled elsewhere. In the consist of each of these trains is a baggage car, stocked with ice, with which those of the excursionists who are disciples of Izaak Walton may preserve the fish they have caught in the vicinity of Montauk and Greenport. The "ice" car is operated at the head-end of the train and is immediately followed by one or two coaches, reserved for fishermen, where the packing of the fish in ice can be accomplished conveniently.

What They Lose on Trains

Opening a brown paper bag turned in by the conductor of a suburban train, the attendant at the lost and found bureau of the Pennsylvania in New York was considerably surprised to find a human skull. No murder mystery was brought to light by the discovery, however, as an anxious Pittsburgh medical student soon appeared to claim the skull. False teeth, wooden legs, wigs and glass eyes are only a few of the queer and unusual articles which have been left on Pennsylvania trains by forgetful passengers. A set of false teeth in good working condition still repose in the lost and found bureau at the Pennsylvania station in New York, where they have been left unclaimed by an owner who is either growing a new set of teeth or has gone on a liquid diet. Some time ago, a passenger must have hobbled off his train on one leg for a trainman found a wooden leg on a seat and turned it in, but the owner never appeared. Even a full-size radio was recently deserted by its owner. Many people who patronize the lost and found bureau are chronic losers of their belongings. One woman within the space of three months lost the same umbrella three times, and on each occasion it was recovered and returned to her. On another occasion, a clergyman came in to reclaim his umbrella. Three weeks later he was back for a lost prayer book and within three more days came in again for a pair of gloves, which were restored to him.

NEWS

Emergency Board Suggests Revision of Labor Rules

Report on L. A. & T. case found, in hourly basis, some merit over hours-mileage system

The emergency board appointed by President Roosevelt to investigate the wage dispute between the Louisiana, Arkansas & Texas and its train service employees, which recently submitted a report concluding that the action of the company in putting into effect a new schedule of rates of pay, rules and working conditions on June 3 was unjustified, as reported in last week's issue, nevertheless found some merit in the company's efforts to substitute a straight hourly basis of pay instead of the dual hours-mileage system generally in effect. The board expressed the belief, however, that any such changes as are found to be needed should be made to apply to the railroads as a whole rather than to one system, saying:

"The members of this board would suggest that in view of changed conditions under which labor works, due to technical improvements, increase of speed, and the like, and the new forms of competition faced by carriers, a careful revision of rules governing rates of pay and working conditions should be made. The board feels, however, that such changes as are needed should be made to apply to carriers as a whole rather than to one system or even one line. The involved rules that have been built up during the past fifty years or more have in many instances become obsolete. What was at one time a protection has become a hindrance. An example of this is found in restricting the application of the seniority rules to one division rather than broadening it to apply to an entire system.

"It is evident to the members of this board that certain rules applying admirably to large systems may work a hardship on small systems or even on separate divisions of the same system. Here, again, we feel the needed changes are beyond the province of this board. Any such changes as are needed should be made by those who have wide knowledge of the subject, and should never be left to the arbitrary judgment of one party. Such changes should be given general rather than local study and application."

Similar questions were involved in the dispute on the Kansas City Southern on which an emergency board recently reported, Frank P. Douglass being chairman of both boards. In that case the board found some reason for the railroad's desire to adopt a new system, but expressed the opinion that the employees would not accept such a revolutionary change. President Roosevelt has suggested to the management three possible courses of action, expressing preference for a postponement of consideration of the matter for a definite period of time. The other courses suggested were that the rates of pay, rules and working conditions be placed in effect without reservation, or that they be placed in effect for an experimental period.

Travel to Mexico

More than 1,500 American tourists visited Mexico City during the month of July, a movement said to indicate a change in the trend of passenger travel from countries across the ocean to nearby points of interest.

B. & O. Re-enacts Historic Race

The historic race between the Baltimore & Ohio's Tom Thumb and a horse-drawn car, held on August 25, 1830, was re-enacted at Chicago on August 25, 1933, in connection with A Century of Progress Exposition. Through the courtesy of the Illinois Central, two parallel tracks between Thirty-fifth and Thirty-ninth streets were made available for the race.

Fares on Air Lines 6.1 Cents a Mile

The average cost of a trip on an air line in continental United States is 6.1 cents a mile, as calculated by the Aeronautics Branch of the Department of Commerce (as of June 30, last). In 1926 the average was 12 cents a mile. The average rate dropped to 11 cents in 1928, and was back at 12 cents in 1929. In 1930 the average was 8.3 cents, and in 1931, 6.7 cents. On long air journeys, the price of a ticket generally includes meals.

Club Meetings

The Central Railway Club of Buffalo (N. Y.) will hold its next meeting at the Hotel Statler, Buffalo, on Thursday evening, September 14. This will be "Safety night" with papers by H. R. Cole (Erie), and William Lawles (New York Central). Troop 157 of the Boy Scouts will give a demonstration of first-aid bandaging.

The Car Foremen's Association of Omaha, will hold its next meeting on Thursday, September 14 at 1:45 p. m. in the general foreman's office of the Union Pacific at Council Bluffs, Ia. The discussion will be on the A. R. A. interchange rules.

The Southern & Southwestern Railway Club will have its annual outing at Savannah, Ga., on Thursday, September 21. Headquarters at DeSoto Hotel.

Washington State Passes New Motor Carrier Laws

Creates commission to investigate and report on apportionment of highway costs

A comprehensive plan for the regulation of all types of motor carriers, as well as a new schedule of increased fees to be charged such carriers for their use of the public highways, is embodied in legislation recently enacted in the state of Washington. In addition the legislature went on record with a declaration "that the apportionment of special taxes among motor vehicles of various types should be based upon use of facilities required, and should be sufficient to pay their fair share of the annual costs of highways, including administration, maintenance and construction."

With a view to future legislation in this latter connection, a commission has been created with an appropriation of $15,000 "to make a study of facts upon which there may be based legislation providing for the proper apportionment of highway costs among the various types of motor vehicles using the highways according to the cost caused by the use of each such type of motor vehicle." This study is to be completed in time for submission of the commission's findings with recommendations for legislation to the 1935 legislature.

The new regulatory law divides motor carriers into four classes as follows: Certificated, contract, for-hire and private. Vehicles operated within the corporate limits of any town or municipality are exempted from the law's provisions, as are vehicles engaged exclusively in the transportation of agricultural products from points of production to markets.

"Certificated carrier" is Washington's designation for the common carrier. Such operators are required to obtain certificates of public convenience and necessity from the Department of Public Works, which body may grant a certificate for territory already served only if the existing certificate holder will not provide service to the satisfaction of the Department. Certificated operators are subject to regulation in such matters as rates, rules, accounts, service and safety of operations; they are required to procure liability insurance or file an indemnity bond.

A contract hauler is defined as an operator of motor vehicles over a regular route or between fixed termini, other than a certificated operator. This type of operator is similar to the certificated carrier in that its operations are regularly conducted over fixed routes, but is different in that it

(Continued on page 381)

Rail Net for July Shows Large Increase over 1932

Total of $64,309,929 compares with $11,287,720 in corresponding month of last year

Class I railroads for the first seven months of 1933 had a net railway operating income of $216,740,345, which was at the annual rate of return of 1.64 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In the first seven months of 1932, their net railway operating income was $120,900,560, or 0.91 per cent.

Operating revenues for the first seven months totaled $1,708,940,892, compared with $1,818,703,533 for the same period in 1932, a decrease of 6 per cent. Operating expenses amounted to $1,263,853,252, compared with $1,456,699,260 for the same period in 1932, a decrease of 13.2 per cent. Class I railroads in the seven months paid $157,602,694 in taxes, compared with $170,009,494 for the same period in 1932, a decrease of 7.3 per cent. For July alone, the tax bill amounted to $23,504,639, a decrease of $368,304 under July, 1932.

Forty-five Class I railroads failed to earn expenses and taxes in the first seven months of 1933, of which 11 were in the Eastern district, 9 in the Southern and 25 in the Western.

CLASS I RAILROADS—UNITED STATES

	1933	1932	Increase, per cent
Month of July			
Total operating revenues	$293,714,774	$235,332,794	24.8
Total operating expenses	194,911,945	189,814,609	2.7
Taxes	23,504,639	23,872,943	1.5*
Net railway operating income	64,309,929	11,287,720	469.7
Operating ratio — per cent	66.36	80.66	
Rate of return on property investment — per cent	2.75	0.48	
Seven Months Ended July 31			
Total operating revenues	$1,708,940,892	$1,818,703,533	6.0*
Total operating expenses	1,263,853,252	1,456,699,260	13.2*
Taxes	157,602,694	170,009,494	7.3*
Net railway operating income	216,740,345	120,900,560	79.3
Operating ratio — per cent	73.96	80.10	
Rate of return on property investment — per cent	1.64	0.91	

*Decrease

Class I railroads for July had a net of $64,309,929, which, for that month, was at the annual rate of return of 2.75 per cent on their property investment. In July, 1932, their net was $11,287,720, or 0.48 per cent. Operating revenues for July amounted to $293,714,774, compared with $235,332,794 in July, 1932, an increase of 24.8 per cent. Operating expenses in July totaled $194,911,945, compared with $189,814,609 in the same month in 1932, an increase of 2.7 per cent.

Class I railroads in the Eastern district for seven months had a net of $140,541,186, at the rate of 2.12 per cent. For the same period in 1932, their net was $102,958,976 or 1.56 per cent. Operating revenues in the Eastern district for seven months totaled $874,880,381, a decrease of 6.9 per cent below the corresponding period in 1932, while operating expenses totaled $621,274,129, a decrease of 13.8 per cent. Railroads in the Eastern district for July had a net of $35,732,133, compared with $9,749,160 in July, 1932.

Railroads in the Southern district for seven months had a net of $33,214,538, at the rate of 1.80 per cent. For the same period in 1932, their net amounted to $6,270,904, at the rate of 0.34 per cent. Operating revenues in the Southern district for seven months amounted to $225,249,886, an increase of 0.3 per cent above the same period in 1932, while operating expenses totaled $166,894,259, a decrease of 12.9 per cent. Class I railroads in the Southern district for July had a net of $7,166,259, compared with an operating deficit of $1,230,845 in July, 1932.

Railroads in the Western district for seven months had a net of $48,984,621, which was at the rate of 0.90 per cent. For the same seven months in 1932, they had a net of $11,670,680, at the rate of 0.24 per cent. Operating revenues in the Western district for seven months amounted to $608,810,625, a decrease of 7 per cent, while operating expenses totaled $475,684,864, a decrease of 12.7 per cent. For July the railroads in the Western district reported a net of $21,411,537. The same roads in July, 1932, had a net of $2,769,405.

Pennsylvania Has Record Week-End Crowd

The greatest week-end crowd ever experienced by the Pennsylvania at the Chicago Union Station was moved on August 26-27, when 41 special passenger trains and extra sections of regular trains were required to carry visitors to the Century of Progress Exposition. The Pennsylvania Limited arrived in Chicago on August 27 in five sections and practically every other through train was run in two or more sections.

New Tourist Sleeping Cars on Great Northern

A new type of tourist sleeping car has been adopted by the Great Northern as another move in its campaign to regain business lost to the private automobile and the buses. Recently the road introduced two-cent-a-mile fares on a system-wide basis.

The new cars have 16 lower berths and uppers, with large dressing and smoking rooms at each end. The seats are richly upholstered, each berth has individual lights, and other appointments are very similar to those in standard Pullman cars. The first of the new cars was on the Empire Builder out of St. Paul, Minn., on August 26, and the eight trains operated in the Pacific coast service are now carrying the new equipment.

E. H. Wilde, Great Northern general passenger agent, believes the recent moves will go far toward increasing the popularity of train travel. Day coach passengers also are privileged to buy berths for the night in the tourist sleepers.

Co-operation Between Rail and Water Lines Proposed

Plan for the creation of standing committees to promote rate stability considered

A plan for the creation of standing committees representing the rail lines and the water lines in specified regions to discuss proposed reductions in rates for competitive reasons before they are made effective, for the purpose of promoting stability in rates and discouraging destructive competition, was considered and favorably received at a conference held by Joseph B. Eastman, federal co-ordinator of transportation, on September 6, with committees representing the rail and water carriers. According to a statement issued later by Mr. Eastman:

"It was agreed by all participating in the conference that it would be highly desirable if a plan could be made effective under which standing committees representing, respectively, the rail lines and the water lines in specified regions of the country would keep each other fully informed of all proposed reductions in rates for competitive reasons and discuss such proposed changes freely before attempting to make them effective, the idea being to promote stability in rates and discourage destructive competition. The plan would also contemplate a similar interterritorial organization for purposes of discussion where proposed rate changes would affect more than one region. The representatives of the rail lines were disposed to concede that in the case of port-to-port rates the water lines are in general entitled to a differential under the corresponding rail rates, and that this principle could be extended, within reasonable limits, to joint rail-and-water rates.

"The committee representing the rail lines is ready to proceed with the formulation of a definite plan to the above effect in collaboration with a similar committee representing the water lines generally. The representatives of the water lines participating in the conference undertook to arrange for the formation of the latter committee. Gen. Ashburn agreed to undertake the task of enlisting the co-operation of water lines which did not participate in this morning's conference. The Federal Co-ordinator of Transportation believes it very desirable that such co-operation should be assured, and is hopeful that it will be tendered."

The railroads of the country collectively were represented by a committee made up of J. L. Eysmans, vice-president of the Pennsylvania, Paul Shoup, vice-chairman of the Southern Pacific, and A. R. Smith vice-president of the Louisville & Nashville. The water lines were represented by H. S. Noble and G. B. Wright, for the Association of Regulated Lake Lines; C. W. Cook and Oliver Caldwell, for the Gulf-Pacific Conference; H. L. Cricher and R. J. Narelle, for the Canal Carriers' Association; Gen. T. Q. Ashburn, for the Federal Barge Line; and C. W. Childress, for the Mississippi Valley Barge Line. The U. S. Intercoastal Conference was

represented through R. A. Thackera and W. Rudrow, as observers. Admiral H. I. Cone of the United States Shipping Board was also present.

Notes on the Fair

Commuters who have been riding suburban trains of the Illinois Central throughout the 40 years since the last Chicago World's Fair will be given a specially-designed certificate by the railroad on September 14, which is "1893" day at A Century of Progress Exposition. President L. A. Downs will present the certificates when the commuters arrive at the Fair. They are to come on a train drawn by an old locomotive now in use in The Wings of A Century pageant.

Fair Doubles I. C. Suburban Service

Passenger travel on the Illinois Central electrified Chicago suburban service more than doubled during August, due chiefly to heavy travel to A Century of Progress grounds. During the first 20 days of the month, the number of suburban passengers carried increased 1,318,383, or 108 per cent, compared with the corresponding period last year, the total for August this year being 2,560,847. The season's record day was August 22, when 155,897 passengers were carried, compared with 74,-191 on the same day last year. In July, there were 3,441,256 passengers, compared with 2,042,387 in July, 1932.

Applications For R. F. C. Railroad Loans Slowing Up

With the improvement in railroad traffic and earnings in recent months there has been a marked slowing up in applications from railroads to the Reconstruction Finance Corporation and the Interstate Commerce Commission for loans. A report of the corporation made public this week giving the status as of the close of business on August 29 showed a total of $411,701,426 of loans to railroads authorized since the corporation began operation on February 2, 1932, of which $381,321,802 had been advanced and $50,184,353 had been repaid. Up to June 26 the corporation had advanced $372,778,401 but since then there have been very few applications.

Pennsylvania Anti-Trust Case Appealed to Supreme Court

The Interstate Commerce Commission has petitioned the Supreme Court of the United States for a writ of certiorari to the circuit court of appeals for the third circuit seeking a review of the decision of the lower court setting aside the commission's order which had directed the Pennsylvania Railroad and the Pennsylvania Company to divest themselves of stock of the Wabash and the Lehigh Valley because of a finding of the commission that the stocks were acquired in violation of the Clayton law. In a brief supporting the petition counsel for the commission said the case as now presented turns on the correctness of, and support in the record for, the commission's finding that the effect of the acquisition may be to substantially lessen competition and on the correct construction of the phrase in the law exempting acquisitions "solely for investment." They said it is of prime importance that there be an authoritative determination of the question as a guide in other proceedings under the Clayton act.

L. & N. to Continue Two-Cent Fare Experiment

The Louisville & Nashville has applied to the Interstate Commerce Commission for the necessary orders modifying previous orders relating to the maintenance of the standard interstate level of passenger fares and Pullman surcharges in several states to provide for the continuation for another six-months of its experimental two-cents-a-mile passenger fare. This rate was adopted earlier in the year for a six-months experiment but that length of time has proved insufficient to demonstrate the effect. The result, however, inspires the hope that the reduced rate will eventually accomplish the desired purpose as the downward trend of passenger revenues has been modified.

Freight Surcharge to Expire At End of Month

The freight rate surcharges authorized by the Interstate Commerce Commission in Ex Parte No. 104 in lieu of the 15 per cent increase in freight rates asked by the railroads in 1931 will expire on September 30, under the provisions of the commission's order which extended them for six months from the original date of expiration, March 31. They became effective on January 4, 1932. The railroads have filed tariffs with the commission adding the amount of the surcharges to rates reduced for an experimental period to meet truck competition where in making the reductions it was necessary under the commission's order to make them in the basic rates and then add the surcharge.

Favors Turning Rail Branches into Auto Roads

A suggestion that America's network of branch line railroads be transformed into motor highways for commercial and military efficiency of the nation's transportation system was suggested by Lieutenant Colonel Brainerd Taylor of the quartermaster corps, U.S.A., at the opening of the International Automotive Engineering congress in Chicago on August 29. "These branch lines," he said, "were developed with animal transport as an auxiliary. The practical operating radius for the horse was 16 miles a day for a round trip. This tallies closely with the average distance between branch line railways. With modern motor trucks, the operating radius of the feeders of railroad trunk line traffic is more than 100 miles.

"Modern highways should replace or supplement branch line railways where operation of such lines is obsolescent practice. In many cases, the transformation of trunk lines, which no longer earn their operating and maintenance expenses, into new highways for fast freight and passenger service, truck and bus, is suggested. The old railroad beds are wonderfully ballasted and ready for smooth road surfacing. They connect all the important towns and villages with more important terminals and trunk line railroads. However, motor transport highways should never be constructed and used to replace or injure our trunk line railways."

Eastern Roads Disposed to Co-operate on Distribution of Work

That Eastern railroads would do all in their power to conform with the views of Co-ordinator Joseph B. Eastman on the distribution of work among as many employees as possible was an opinion expressed informally following a meeting of railroad officers in New York on September 6.

The meeting was called by E. J. McClees, secretary of the bureau of information, Eastern Railroads. All important Eastern railroads were represented by officers accustomed to deal with railroad labor problems.

It was decided at the meeting to have each railroad discuss Mr. Eastman's proposals with its own union memberships. This policy, it was explained, was to be followed because contracts with the unions were signed by the managements as individuals and not as groups, and because distribution of employment was expected in many cases to involve union rules to which the managements had acceded by contract.

In general, Mr. Eastman recommended a six-day week and an eight-hour day, with overtime reduced to a minimum. He suggested further that employees in train and engine service who are still accumulating high monthly mileage, agree to a reduction compatible with the minimum mileage specified in prevailing labor agreements. The carriers and representatives of these groups will hold conferences in an effort to bring this about.

Chicago Labor Day Traffic Heaviest in Recent Years

The largest passenger traffic movement in the Middle West in recent years was handled on September 2, 3 and 4, when an estimated 100,000 persons were carried into Chicago by railroads as a result of the low rates in effect for the Century of Progress Exposition now being held in that city.

The Pennsylvania alone carried a total of 21,900 persons into Chicago, and approximately the same number out. The increased business necessitated the operation of 110 extra trains, 51 in and 59 out of Chicago. In addition to the Chicago business, 11 extra trains were required in other parts of the western region. The peak of the Chicago movement on this road occurred on September 3, when 20,000 persons were carried to or from Chicago. Forty-seven extra trains were operated in both directions. Between 7 a. m. and 9 a. m., 26 through trains from New York, Philadelphia, Washington, Cincinnati, and Louisville, arrived in Chicago, while on Monday night, 14 trains were dispatched from Chicago between 11.25 and 11.45.

The New York Central Lines brought 20,671 passengers into Chicago on the three days, the movement involving 81 extra sections; 35 over the Michigan Central, 20 over the Cleveland, Cincinnati, Chicago & St. Louis and 26 over the New York Central. The peak movement occurred on Monday, September 4, when 9,629 persons were carried out of the city.

Another heavy movement was that over the Chicago, Aurora & Elgin, an electric line, which moved over 40,000 persons in and out of Chicago on the three days. This road averages about 10,000 persons on a normal day.

The number of passengers handled by other roads were approximately as follows: Chicago, Burlington & Quincy, 8,000; Atchison, Topeka & Santa Fe, 6,000; and Baltimore & Ohio, 2,000. The business of the Chicago & North Western exceeded that of the July 4 holiday.

Action on Western Fare Reductions to Be Considered Later

Proposals for a reduction in passenger fares from the present basic rate of 3.6 cents a mile and certain phases of co-operation between the railroads and the office of the national railroad co-ordinator were among the subjects discussed at a meeting of the Western Association of Railway Executives at Chicago on September 1. There was a variety of opinions as to what the lower rate should be and as to whether there should be a differential between the coach and sleeping car rates. The subject was referred back to the committee consisting of Paul Shoup, vice-chairman of the Southern Pacific, Fred Sargent, president of the Chicago & North Western, Carl Gray, president of the Union Pacific, Ralph Budd, president of the Chicago, Burlington & Quincy, and H. A. Scandrett, president of the Chicago, Milwaukee, St. Paul & Pacific. This committee met with the passenger traffic officers on September 5 for a further consideration of the subject and will report on October 1.

The executives also appointed a committee to take over the activities of the Committee on the Elimination of Preventable Waste. The old committee was organized six months ago for the purpose of devising ways whereby the roads might co-operate to effect savings, for example, the revision of passenger service to eliminate unprofitable trains. Under the old committee there were six regional committees, with headquarters in various cities in the territory of the western roads. The new co-ordinating committee consists of five members, including Messrs. Gray, Budd, Scandrett, Hale Holden, chairman of the Southern Pacific, and Samuel T. Bledsoe, president of the Atchison, Topeka & Santa Fé. H. G. Taylor, chairman of the Western Association of Railway Executives, was elected executive secretary of the committee, and E. C. Webster, executive secretary of the western group of the Regional Co-ordinating Committee, was elected assistant executive secretary.

Fourteen Passengers Killed at Binghamton

In a collision on the Erie at Binghamton, N. Y., on September 5, at about 8:30 p. m., 14 passengers were killed and 25 or more injured. Eastbound passenger train No. 8, the Atlantic Express, had been stopped about two miles east of the station because of switching going on on the main track, and was run into at the rear by a following milk train of eight cars.

The passenger train was made up of steel cars, except for one wooden coach, which was the third car from the rear, and the fatalities were in this car, which was crushed by the heavier cars behind it. The rear car was crushed for a length of eight feet, but the colliding locomotive was not derailed.

The flagman of No. 8 had gone back with a red light and torpedoes. The engineman of the milk train is reported to have said that he did not see any warning signal. At this writing the details as to the behavior of the flagman and the engineman remain unexplained.

The milk train had been stopped at the entrance to Binghamton station while the passenger train was doing work at the station, and followed it in two minutes. It received a caution signal at Liberty street interlocking, one-half mile east of the station, and at BD interlocking, 2000 ft. farther east, it received a calling-on signal, which was acknowledged. This acknowledgment was compulsory as automatic train control is in effect in this territory and the signal could not have been passed without the acknowledgment. At BD it was three minutes behind No. 8. It struck the passenger train at about 5800 ft. east of BD tower.

Waterway and Highway Operators Becoming Fair-Competition-Conscious

Representatives of truck and waterway operators, who are about to be asked to sign codes of fair competition under the provisions of the national industrial recovery act, have expressed some apprehension as to the effect of such procedure on their competition with the railroads, who will be under a different form of regulation, and, after years of unrestricted rate-cutting while the railroads were restricted, are uttering many complaints because the Interstate Commerce Commission has recently indicated more liberality in allowing railroads to reduce rates on short notice. A group of waterway representatives after a recent meeting in Chicago has asked Co-ordinator Eastman to arrange for a joint meeting with representatives of the railroads to discuss the problem, and representatives of the truckers, in meetings in Washington, have been indicating a new interest in the subject of federal regulation.

Representatives of the Federated Truck Associations of America have submitted to Co-ordinator Eastman a protest against "the practice of the railroads in cutting rates to meet or to destroy truck competition when such rates are less than the cost of service rendered by the railroads." The association had previously adopted a resolution requesting the President, the railroad co-ordinator and the head of the National Recovery Administration "to use their authority to prevent such unfair practices, and to remedy such unfair conditions as now exist because of such practices." The preamble of the resolution said that "the railroads, at the expense of long distance shippers and of local shippers of other commodities, have been establishing so-called cut rates to meet truck competition, which rates do not return anywhere near the cost of transportation to the carrier, and are made for the sole purpose of destroying competition whereupon other rates will be established."

John W. Blood, president of the association, has announced the appointment of a legal advisory committee on federal regulation of motor trucks, stating that it is proposed to try to develop, with the aid of a general legislative committee of truck owners, plans for "fair and reasonable regulation." He said it was proposed to tackle the truck regulatory problem "purely from the interest of those engaged in the business" and "not to use formulas designed for railroad regulation."

The National Recovery Administration has made preparations for handling codes for oceanic, intercoastal, coastwise, Great Lakes and river shipping, and William H. Davis, of New York, has been appointed deputy administrator to handle such codes when they are submitted.

The board of directors of the American Highway Freight Association has adopted a tentative general code to be submitted to the N. R. A. covering all the mandatory provisions and those general provisions covering the industry as a whole on which complete agreement can be reached, with provision for the filing of appendices covering regional variations. The proposed code provides that it shall be the privilege of any natural division of the industry to engage in voluntary agreements upon rates, rules, and regulations affecting rates, the method to be determined by the division with the approval of a central committee and of the N.R.A. A proposed code for the bus industry is still the subject of conferences between various groups of the industry and officials of the N.R.A., following a hearing held last week.

The N. R. A. has advised the Inland Waterways Corporation of a ruling that government agencies are not subject to the provisions of the law relating to codes.

$70,000,000 for River and Harbor Work

A rivers and harbors program calling for the expenditure of $70,000,000 from the Public Works fund was announced on August 31 by Public Works Administrator Harold L. Ickes. This made a total of $1,397,896,138 allocated to date from the $3,300,000,000 public works fund.

The resolution adopted by the Special Board for Public Works allotted the War Department $70,000,000 in a lump sum for 90 river and harbor projects. The list contains 13 river projects, 7 intracoastal waterway projects, 6 Great Lakes connecting channels projects, 19 seacoast harbor projects on the Atlantic Coast, 12 seacoast harbor projects on the Gulf, 11 seacoast harbor projects on the Pacific Coast, 17 harbor projects on the Great Lakes, 3 seasoast harbor projects in the Hawaiian Islands and 1 in Puerto Rico. The office of Chief of Engineers, War Department, told the Public Works Administration that the $70,000,000 allotment will provide 40,000 man-years of work.

The river improvements listed amount to $16,822,000, including $3,000,000 for channel stabilization on the Mississippi river between the Ohio and the Illinois rivers; $2,450,000 for lock and dam construction and $1,425,000 for open channel work on the Ohio river; $6,015,000 for the Kanawha river; $900,000 for the Allegheny river; $910,000 for the Illinois river; and $868,000 for the Cumberland river. This allotment is in addition to $11,500,000 pre-

viously authorized for work on the upper Mississippi river and $14,153,108 for the Missouri river. The intracoastal waterway allotments include $2,000,000 for the waterway between Jacksonville and Miami, Fla.; $1,250,000 between Cape Fear River, N. C., and Winyah Bay, S. C.; $1,000,000 between Winyah Bay and Charleston, S. C.; and $872,000 for the Louisiana-Texas Intracoastal waterway between New Orleans, La., and Galveston, Tex.

Washington State Passes New Motor Carrier Laws

(*Continued from page 377*)

serves only those with whom it has contracts. Contract haulers are required to obtain permits and to conduct their operations under written contracts, copies of which must be filed with the Department of Public Works. These contracts must show all charges and the Department is given power to fix fair and reasonable rates, operating rules, etc., and to prescribe safety requirements. Also, contract haulers are required to keep in force liability and property damage insurance or an indemnity bond.

The third classification—for-hire carriers—is designed to cover operators who serve all who may choose to employ them, but who have no regular routes or fixed termini. These, too, are required to obtain permits, but regulation of them is based largely on considerations of safety. They are required to carry liability insurance or an indemnity bond similar to that required of certificated carriers and contract haulers.

Those in the remaining class of operators—private carriers—are required to obtain permits, but these are issued as a matter of right when applications are in order and applicants have observed all regulations and submitted such data as the Department of Public Works may require.

Hours of service sections of the law stipulate that no driver employed by a certificated carrier, a contract hauler or a for-hire carrier shall be permitted to remain on duty continuously for more than 10 hours; when a driver has completed such a tour of duty he must be relieved for at least eight consecutive hours. Also, no driver is permitted, except in emergencies, to work more than an aggregate of 10 hours in any 24-hour period.

The increased fees for the use of the highways are to become effective January 1, 1934, and are imposed on all buses, trucks and trailers except those of one-half ton or less rated capacity. Buses are to be assessed annually a flat fee of $3 plus $4.50 per seat; this is an increase of $1.50 per seat over the present assessment. Truck and trailer fees are to be increased in amounts ranging from 50 to more than 100 per cent. All these property carriers will pay a flat fee of $3 plus varying amounts based on maximum rated carrying capacity. These latter charges will range upward from $37.50 per year for a truck or trailer of 5,000 lb. capacity or less to a maximum of $600. In addition, certificated carriers, contract haulers and for-hire operators must pay a gross revenue tax.

Equipment and Supplies

LOCOMOTIVES

THE LOUISVILLE & NASHVILLE plans to dismantle 250 locomotives and 4,000 freight cars during the next four or five months.

FREIGHT CARS

THE ALASKA RAILROAD is inquiring for 10 air dump cars.

THE WESTERN FRUIT EXPRESS COMPANY has purchased 100 underframes from the Minneapolis Moline Company.

THE WAR DEPARTMENT, UNITED STATES ENGINEERS, New Orleans, La., is inquiring for bids on September 9 for four electrically propelled asphalt cars of 20 tons' capacity.

IRON AND STEEL

THE WABASH is inquiring for 160 tons of structural steel for grade separation work at Urbana, Ill.

THE ERIE has ordered 640 tons of structural steel for grade crossing elimination work at Elmira, N. Y., from the American Bridge Company.

MISCELLANEOUS

THE DELAWARE, LACKAWANNA & WESTERN is installing a Whiting drop pit table at Secaucus, N. J.

THE PENNSYLVANIA has put 10,000 additional men to work since June 1, according to a statement of President W. W. Atterbury, in a radio address on September 3, under the auspices of the National Recovery Administration.

THE MAINE CENTRAL will during this month increase the number of men employed at its Waterville, Maine, shops. The shops will work full time, or 26 working days during September and a total of 300 workmen will be employed as compared with 273 in August. The increase, Executive Vice-President D. C. Douglass said, is necessitated by an increase in the railroad's traffic with consequent need for additional equipment.

Boston & Maine Increases Shop Forces

The Boston & Maine will increase the number of workmen employed in its repair shops by 205 men in September. The September employment in the railroad shops at Billerica, Mass., and at Concord, N. H., and at Keene, will total 1166 men, as compared with 961 in August, with an increase in appropriation for the shops of $38,682.

The principal increase will be at the Concord, N. H., car shops where a total of 480 men are at work, as compared with 316 employed there in August. All of the increase of 164 men will be in the freight car repair shops, where additional employment for more men will be provided as the railroad further progresses its recently announced program of 100,000 man-hours of labor for workmen who have been practically idle for the past two years. This is being made possible by the new repair program calling for an expenditure of approximately $400,000 in rebuilding 500 gondola coal cars. The passenger car repair shops at Concord will work the same schedule as in August, when 220 men worked a staggered schedule of three-quarters time.

At Billerica locomotive repair shops 650 men will be called in September for full time of 22½ working days, as compared with 570 men in August. At the Keene, N. H., shops three-quarters of the normal force will continue to work the full month, or 22½ working days, with the same number of men employed as in August.

The increase, according to Vice-President J. W. Smith's announcement, is due to an increase in the railroad's traffic, with consequent need for additional equipment.

Supply Trade

C. W. Rhoades has taken over the railway sales of the **Stromberg Motoscope Corporation,** with headquarters at 353 Railway Exchange Building, Chicago.

The Vascoloy-Ramet Corporation, North Chicago, Ill., has been organized for the manufacture of all grades of tantalum carbide and the production of all kinds of tantalum carbide cutting tools, dies, wearing surfaces and similar products. In this company are consolidated the tantalum carbide manufacturing divisions of the **Vanadium-Alloys Steel Company,** the **Fansteel Products Company, Inc.,** and the **Ramet Corporation of America.**

OBITUARY

Kenneth A. Kemmerer, assistant to traffic manager in charge of terminal railroads, Bethlehem Steel Company, died on August 29 at Lankenau hospital, Philadelphia, Pa., after a brief illness. Mr. Kemmerer, who was 42 years of age, was a native of Bethlehem and was active in many local affairs. He was a graduate of Bethlehem High School and attended Lehigh University. He started his business career with the Lehigh Valley Railroad, and for the past 18 years was in the employ of the Bethlehem Steel Company.

Henry W. Darling, formerly for 30 years treasurer of the General Electric Company, died at his home in Schenectady, N. Y., on September 4. Mr. Darling was 86 years old at the time of his death. He was engaged in banking business in Canada until 1890, when he came to the United States to go with the Edison General Electric Company with headquarters at New York and had been connected with the General Electric Company since its organization in 1892. He resigned as

treasurer of the company in 1924 and at that time the board of directors elected him a vice-president and conferred on him the honorary title of treasurer emeritus.

Warren A. Bechtel, president of Six Companies, Inc., an affiliation of six contracting companies organized to build the Boulder dam, died in Moscow, Russia, on August 28, following an overdose of medicine. He was born on September 12, 1872, at Freeport, Ill., and obtained his first railroad contract for some team work on the Chicago, Rock Island & Pacific's extension westward from Chickasha, Okla. After working on the construction of various railroads, he became an estimator for the Southern Pacific at Wadsworth, Nev., and later superintendent on a track-laying job at Lovelock, Nev. He then became a subcontractor on small earth-work contracts, chiefly for the railroads. In 1918, he constructed a railroad for the Hutchinson Lumber Company near Oroville, Cal. He later organized the firm of W. A. Bechtel Company, which was employed on second-track work for the Atchison, Topeka & Santa Fe in New Mexico and Arizona, and built branch lines for the Western Pacific. In 1928, he was elected president of the Associated General Contractors of America. He was also associated with the Trans-Bay Construction Company, which built the foundations of the East Bay section of the San Francisco-Oakland bridge. In August, 1931, he was made president of Six Companies, Inc.

Henry M. Sperry

Henry Muhlenberg Sperry, publicity representative of the Union Switch & Signal Company and the General Railway Signal Company, died on September 2 at his home in New York City, after a brief illness.

Henry M. Sperry

Mr. Sperry was born on August 4, 1861, at Baltimore, Md., and received his education at the Protestant Episcopal Academy in Philadelphia, Pa.

In August, 1881, Mr. Sperry entered the service of the Pennsylvania Railroad as a member of the engineering corps, New York division. In 1887 he became supervisor of signals of this division, and it was during his administration that the line from Philadelphia to New York was changed from a two-track to a four-track road, which required the construction of a large number of interlocking plants. In December, 1891, he left the Pennsylvania to become general agent for the Johnson Railroad Signal Company, in which position he had general charge of the construction of new block signals on the New York Central. During the illness of the president and later of the general manager, he was acting manager of the Johnson company.

In June, 1894, Mr. Sperry became signal engineer and agent for the National Switch & Signal Company, in charge of the Western district, during which time he designed and built the large interlocking plant at State Line, Ind., and the extensive signaling installations of the Chicago Elevated railroads.

In January, 1899, he was appointed signal engineer and agent for the Union Switch & Signal Company at New York. While in this position he prepared plans and made a report on the reconstruction of the St. Paul Union Depot, St. Paul, Minn.; also prepared the preliminary plans and method of signaling for the subways operated by the Interborough Rapid Transit Company, New York City, and prepared plans and had charge of construction of signaling of the New York & Long Branch.

In February, 1905, he became the consulting signal engineer for the Hudson Companies, New York, and prepared plans and reports covering the four tunnels under the Hudson river and the large terminal station at Church street, New York. He was also at this time consulting engineer for the Kinsman Block System Company, New York. One year later he became resident manager for the General Railway Signal Company at New York; in January, 1910, he was sales manager, and in November, 1914, he was made manager of the department of publicity and education of this company.

On January 1, 1917, Mr. Sperry took up duties as publicity representative of the Union Switch & Signal Company, the General Railway Signal Company, the Federal Signal Company and the Hall Switch & Signal Company (the latter two were subsequently absorbed by the former two companies), which he continued until the time of his death.

Mr. Sperry was one of the early exponents of the economics of railway signaling and took an active part in the work of the original Railway Signaling Club, now the Signal Section of the American Railway Association. He was for many years director of the National Railway Appliance Association of which he was president in 1916. He was also a member of a number of societies and clubs, including the Railway and Locomotive Historical Society, the Transportation Club, the New York Railroad Club, the American Society of Civil Engineers and the Institution of Railway Signal Engineers of England.

In his position as publicity representative of the two chief signal manufacturers, Mr. Sperry was active as a general promoter—for the benefit of the general public as well as of the railroads—of knowledge of the value of this feature of railroad operation, both as a safety measure and for economy, and in this work he issued numerous booklets and reports.

Construction

CALIFORNIA, SHASTA & EASTERN.—This company has applied to the Interstate Commerce Commission for a certificate authorizing the construction of a 20-mile branch line from Palo Cedro, in Shasta county, Cal., to the holdings of the Red River Lumber Company, stating that it proposes to apply for a loan of $300,000 from the Reconstruction Finance Corporation for this purpose and to rehabilitate its existing line.

PITTSBURGH & WEST VIRGINIA.—This company has undertaken the reconstruction of two grade separation structures at Pittsburgh, Pa., to provide for Cooper's E65 loading. In the structure over Banksville avenue this involves the reinforcement of towers and the introduction of new girders, while in the bridge over Independence street it entails the complete replacement of the girder structure. The total estimated cost of this work is $75,000.

Financial

NEW YORK CENTRAL.—*Abandonment.*—This road has been authorized by the Interstate Commerce Commission to abandon that portion of its Belmar branch extending from a point 1.25 mi. south of Franklin, (Pa.) station to a point 1,000 ft. north of Belmar station, 4.14 mi.

PENNSYLVANIA.—*Abandonment.*—The Interstate Commerce Commission has authorized the abandonment by this road of a 1.08-mi. section of line extending from a connection with its South West branch near Dunbar, Pa., to Mahoning Works.

SOUTHERN PACIFIC. — *Abandonment.* — This company has applied to the Interstate Commerce Commission for authority to abandon branch lines between Colorado, Calif., and Potholes, 11.9 miles, and Felton, Calif., and Boulder Creek, 7.02 miles.

SPOKANE INTERNATIONAL.—*Bankruptcy.*—E. S. McPherson, vice-president and traffic manager, was named by Federal Judge J. Stanley Webster of Spokane, Wash., on August 29, as trustee in charge of operations, following a bankruptcy petition filed by the railroad. On July 1, 1933, semi-annual interest was not met on a general obligation and bond issue of $4,200,000, drawing 5 per cent interest and due July 1, 1955. This default was $105,000. Semi-annual interest was also not paid on a $544,000 issue of first-mortgage bonds on the Coeur D'Alene & Pend Oreille, leaving it in default $13,600. The road will continue regular operation between Spokane, Wash., and Eastport, Idaho. It started operation on November 1, 1906.

Valuation Reports

The Interstate Commerce Commission has issued final valuation reports finding

the final value for rate-making purposes of the property owned and used for common-carrier purposes as of the respective valuation dates as follows:

Mississippi & Western	$80,000	1928
Helena Southwestern	195,000	1927
City of Prineville	240,000	1927
Osage	410,000	1927
Mississippi & Skuna Valley	290,000	1928
Asphalt Belt	325,000	1928
Kentucky, Rockcastle & Cumberland	123,000	1927
Outer Harbor Terminal	101,000	1927
Murfreesboro, Nashville, Southwestern	225,000	1927
Quakertown & Bethlehem	285,000	1927
Nez Perce & Idaho	160,000	1927
Mobile & Gulf	425,000	1928

Dividends Declared

Alabama & Vicksburg.—Capital, 3 per cent, semi-annually, payable October 1 to holders of record September 8.

Beech Creek.—50c, quarterly, payable October 2 to holders of record September 15.

Chesapeake & Ohio.—Preferred, $3.25, quarterly, payable January 1 to holders of record December 8; Common, 70c, quarterly, payable October 2 to holders of record September 11.

Cleveland Railway.—$1.50, quarterly, payable October 1 to holders of record September 25.

Little Miami.—Special Guaranteed, 50c, quarterly, payable September 9 to holders of record August 26.

Northern R.R. of New Jersey.—4 Per cent Guaranteed, $1.00, quarterly, payable September 1 to holders of record August 21.

Old Colony.—$1.75, quarterly, payable October 2 to holders of record September 16.

St. Joseph, South Bend & Southern.—75c, semi-annually; 5 Per cent Preferred, $2.50, semi-annually, both payable September 15 to holders of record September 8.

Vicksburg, Shreveport & Pacific. — Common, 2½ per cent, semi-annually; Preferred, 2½ per cent, semi-annually, both payable October 1 to holders of record September 8.

Average Prices of Stocks and of Bonds

	Sept. 5	Last week	Last year
Average price of 20 representative railway stocks	47.57	50.55	32.49
Average price of 20 representative railway bonds	72.15	72.91	67.74

Railway Officers

EXECUTIVE

W. F. Schaff, general manager of the New York Central, Lines West, has been appointed vice-president and general manager, Line Buffalo, N. Y., to Elkhart, Ind., including the Ohio Central Lines, with headquarters as before at Cleveland, Ohio.

George Herbert, assistant general freight agent of the Delaware, Lackawanna & Western, with headquarters at New York, has been appointed assistant to the vice-president in charge of traffic, with the same headquarters.

William J. Fripp, vice-president in charge of the operating department of the New York Central, with headquarters at New York, has retired after 53 years' service with that road. **Daniel W. Dinan,** general manager, with the same headquarters, has been appointed vice-president and general manager, Lines Buffalo and East.

Mr. Fripp was born on August 25, 1863, at Albany, N. Y., and entered railway service on July 17, 1880, serving until January, 1885, as a yard clerk on the New York Central & Hudson River (now part of the New York Central), at West Albany. From the latter date until February, 1888, he was timekeeper on the Mohawk division, then becoming clerk on

William J. Fripp

the same division, serving in that position until January, 1892. He served as general dispatcher in the West Albany yard until May, 1893, then being appointed trainmaster of the Mohawk division. From September, 1902, to October, 1906, Mr. Fripp was assistant superintendent of the same division, then being promoted to superintendent of the River division. He became assistant general superintendent of the Boston & Albany (part of New York Central System) in February, 1907, and in April of the same year he was promoted to general superintendent of that road. Mr. Fripp was appointed general superintendent of the Eastern district of the New York Central & Hudson River (New York Central) in February, 1910, and in April, 1912, he became assistant general manager of the same road. In January, 1915, he was appointed general manager with headquarters at New York, and in January, 1927, he was promoted to the position of assistant vice-president. Mr. Fripp became vice-president in charge of the operation department of the New York Central in April, 1931, serving in that capacity continuously until the time of his retirement.

Mr. Dinan was born on November 14, 1866, at Whiteport, N. Y., and was graduated from New Paltz Academy in June,

Daniel W. Dinan

1883. He entered railway service in December of the same year as a station agent and telegrapher for the Walkill Valley (now a part of the New York Central), at Binnewater, N. Y. He served subsequently from March, 1886, to November, 1900, as train dispatcher on the West Shore (now also a part of the New York Central) at Kingston, N. Y., and then served consecutively as trainmaster and chief trainmaster of the Pennsylvania division of the New York Central at Jersey Shore, Pa. On October 1, 1904, he was appointed assistant superintendent of the same division and in May of the following year was promoted to superintendent at Corning, N. Y. He became superintendent of the Mohawk division at Albany, N. Y., on April 1, 1911, and general superintendent of the Second district at Buffalo, N. Y., on May 1, 1917. In 1924 Mr. Dinan was promoted to assistant general manager, at Syracuse, serving in that capacity until January, 1927, when he was appointed general manager of the road, with headquarters at New York, the position he held until his recent promotion.

FINANCIAL, LEGAL AND ACCOUNTING

G. B. Wilson, who has been on the staff of the senior vice-president of the Chicago & Illinois Midland, has been elected assistant secretary of the company, with headquarters at Springfield, Ill.

TRAFFIC

E. M. Sellers has been appointed assistant general freight agent of the Delaware, Lackawanna & Western, with headquarters at New York, succeeding **George Herbert.**

J. C. Cumming, traffic agent for the Union Pacific System at Portland, Ore., has been promoted to assistant general freight and passenger agent of the Oregon-Washington Railroad & Navigation Co., with the same headquarters, to succeed **J. P. Cummins,** deceased.

C. B. Bennett, assistant manager of mail and express traffic of the New York Central Lines, with headquarters at New York, has been appointed manager of mail and express traffic, with the same headquarters, succeeding **J. N. Crocker,** retired. The position of assistant manager of mail and express traffic has been abolished.

W. L. McDonald, general agent for the St. Louis-San Francisco at Philadelphia, Pa., has been promoted to general eastern agent, with headquarters at New York, to succeed **Henry F. Sanborn,** deceased. **W. O. Dodge,** soliciting freight and passenger agent at New York, has been promoted to general agent at Philadelphia, to succeed Mr. McDonald.

J. W. Graham has been appointed to the newly-created position of general freight agent on the Chicago Great Western in charge of solicitation throughout the territory east of a line formed by the western shore of Lake Michigan, the eastern boundary of the State of Illinois and the Mississippi river. Mr. Graham, who will be located at Chicago, was formerly vice-president in charge of traffic of the New York, Chicago & St. Louis, leaving

this road three years ago to become general traffic manager of the Pittsburgh & West Virginia. He left the latter company about a year ago.

ENGINEERING AND SIGNALING

J. W. Pfau, acting chief engineer of the New York Central Lines Buffalo and East, has been appointed chief engineer, effective September 1.

W. H. Elliott, signal engineer, New York Central, on the lines Buffalo and East, retired on September 1. Mr. Elliott was born in Savannah, Ga., in 1863 and was graduated from the University of the South in 1883, during which year he entered the services of the Central of Georgia as a locomotive fireman. He was employed as a machinist on the Savannah, Florida & Western from 1884 to 1887; in the latter year he entered the locomotive test department of the Erie. In 1890 Mr. Elliott was appointed assistant to the mechanical engineer of the Chicago, Milwaukee & St. Paul (now C. M. St. P. & P.) and was promoted to signal engineer of that road in 1893, serving in this capacity until 1903, at which time he was appointed signal engineer of the New York Central & Hudson River, now New York Central, and he has continued in this position until his retirement on September 1. Mr. Elliott was a charter member of the Railway Signal Association, now the Signal Section of the American Railway Association and has always been a leader in its activities. He served as chairman of the association in 1918.

MECHANICAL

Effective September 1, the jurisdiction of **C. A. Gill,** superintendent of motive power and rolling equipment of the Reading Company, has been extended to include the Central of New Jersey, succeeding **C. E. Chambers,** who has been granted a leave of absence. A biographical sketch of Mr. Gill's career appeared in the *Railway Age* of September 3, 1932, in connection with the announcement of his appointment as superintendent of motive power and rolling equipment for the Reading.

PURCHASES AND STORES

William A. Hopkins, general purchasing agent of the Missouri Pacific Lines, who has been appointed to the newly-created position of consulting purchasing agent, with headquarters as before at St. Louis, Mo., was born on September 24, 1871, at Moline, Ill. He commenced his business career in 1889 and for the next 10 years was engaged in the construction of electrified street railways in various cities, except for the period from 1891 to 1894 when he was in the employ of the Chicago World's Fair commissioners. In 1899 Mr. Hopkins went with the C. M. Wilmerding Consulting Engineering Company, Chicago, as erecting engineer in charge of the construction of the electrical and mechanical apparatus in the shops of the Chicago, Burlingon & Quincy at Hannibal, Mo. From 1905 to 1909 he was with the Wabash, first as electrical and

William A. Hopkins

mechanical engineer in charge of the construction of the shops at Decatur, Ill., and then as engineer in charge of all electrical power apparatus on the Wabash. He then went with the Safety Car Heating & Lighting Company and in 1911 he entered the service of the Missouri Pacific as supply agent. During the World War Mr. Hopkins was made manager of the Procurement division of the Southwest region of the United States Railroad Administration, later being appointed supervisor of stores for the same region. When the railroads were returned to private operation he was again appointed supply agent for the Missouri Pacific which position he held until 1923 when he was appointed general purchasing agent.

John H. Lauderdale, who has been appointed general purchasing agent of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., has been connected with the Missouri Pacific and its subsidiaries for 28 years. He entered the service of the Gulf Coast Lines in 1905 as chief clerk to the vice-president and general manager, later being advanced to treasurer and purchasing agent. In June, 1918, Mr. Lauderdale was appointed to the staff of the

John H. Lauderdale

director of purchases and stores of the United States Railroad Administration and from 1920 to 1924 he served successively as assistant manager and manager of liquidation of the U. S. R. A. In July, 1924, he returned to railroad service as general purchasing agent of the International-Great Northern and when the I.-G. N. and the Gulf Coast Lines became parts of the Missouri Pacific Lines late in 1924 he was appointed general purchasing agent of both properties. Mr. Lauderdale was holding the latter position at the time of his recent promotion, effective September 1.

A. A. Taylor, who has been appointed to the newly-created position of assistant general purchasing agent of the Missouri Pacific Lines, with headquarters at St. Louis, Mo., has been connected with the purchases and stores departments of this company for 26 years. He was born on January 9, 1888, at Ft. Scott, Kan., and entered railway service with the Missouri Pacific on April 1, 1907, as a material stock clerk. Later he served as storekeeper at Wichita, Kan., Lake Charles, La., McGehee, Ark., Ferriday, La., Osawatomie, Kan., De Soto, Mo., and North

A. A. Taylor

Little Rock, Ark. On April 1, 1923, he was promoted to assistant to the general purchasing agent, which position he was holding at the time of his recent appointment which was effective on September 1.

OBITUARY

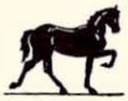
Edward J. Wright, former assistant to the general manager of the New York Central, at Albany, N. Y., died in that city on September 4 at the age of 63. Mr. Wright retired from the service of the New York Central in 1931.

Charles N. Marland, treasurer of the Boston & Maine, with headquarters at Boston, Mass., died suddenly of a heart attack at his home in Ballardvale, Mass., on September 4. Mr. Marland was 62 years old and had been in the service of the Boston & Maine continuously since 1888, when he entered the service of that road as messenger. He subsequently served consecutively as station receiving teller, and assistant to the paying teller. From 1903 to 1914 he was in charge of dividends and bond transfers and on the latter date he became paying teller. He was appointed assistant treasurer in 1916, serving in the capacity until 1928, when he became treasurer of the road.

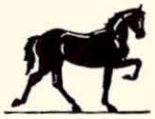
Tables of Revenues and Expenses of Railways begin on next left-hand page

Why Any 10-Year Old Locomotive Is Inadequate

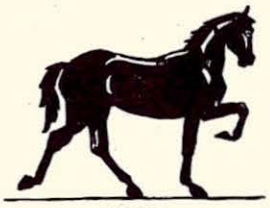
What Has Happened To HORSEPOWER!



1912
475 H. P.
per driving axle



1922
575 H. P.
per driving axle



1932
OVER 1,000 H. P.
per driving axle

What Has Happened To FUEL CONSUMPTION!

1912
6½ LBS. COAL
per drawbar
horsepower

1922
5 LBS. COAL
per drawbar
horsepower

1932
3 LBS. OR LESS
per drawbar
horsepower

SO rapid has been the advance of locomotive design that not a single locomotive in this country over ten years old can begin to hold its own with the really up-to-date power plant on wheels known as the Super-Power locomotive.

LIMA LOCOMOTIVE WORKS
INCORPORATED

LIMA LIMA LOCOMOTIVE WORKS INCORPORATED OHIO

Revenues and Expenses of Railways

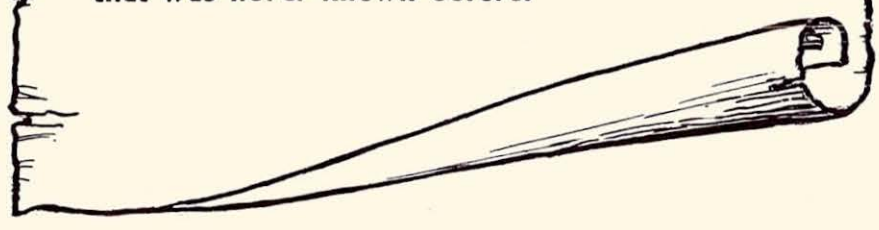
MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Akron, Canton & Youngstown	July	171	$176,740	$25	$187,043	$23,569	$16,007	$6,626	$41,464	$7,140	$94,207	50.4	$92,836	$81,629	$59,992	—$2,015
	7 mos.	171	867,757	126	912,748	108,743	95,650	54,914	258,474	63,199	575,847	63.1	336,901	258,418	183,305	141,812
Alton	July	979	948,226	186,935	1,280,983	150,715	132,990	47,920	425,430	37,689	805,427	62.9	475,556	411,654	259,772	7,297
	7 mos.	979	5,539,803	994,963	7,472,643	847,035	870,494	323,486	2,906,698	292,760	5,316,435	71.1	2,156,208	1,621,771	766,558	—7,556
Alton & Southern	July	31	.....	.....	100,785	6,770	6,933	5,174	27,084	4,411	50,372	49.98	50,413	45,555	40,723	5,706
	7 mos.	31	.....	.....	570,605	47,609	44,253	35,112	186,410	28,858	342,242	59.98	228,363	191,223	159,750	107,656
Atchison, Topeka & Santa Fe	July	9,711	7,619,152	1,292,504	9,579,129	1,190,251	1,924,420	292,192	2,828,358	373,732	6,603,734	68.9	2,975,395	2,162,352	2,300,208	2,669,093
	7 mos.	9,731	43,046,479	6,586,147	54,469,734	7,210,698	13,165,323	2,147,044	19,525,651	2,608,059	44,643,472	82.0	9,826,262	3,748,338	4,362,826	6,501,681
Gulf, Colorado & Santa Fe	July	1,955	1,081,583	58,027	1,202,901	151,593	234,167	49,545	386,010	63,627	874,051	72.7	328,850	242,272	159,291	129,738
	7 mos.	1,955	6,284,529	279,716	7,033,503	1,218,048	1,685,571	344,948	2,640,546	449,350	6,326,958	90.0	706,545	104,134	—564,392	—219,732
Panhandle & Santa Fe	July	1,878	856,009	35,252	932,823	71,059	135,568	18,787	190,840	29,939	446,151	47.8	486,672	447,068	376,776	210,901
	7 mos.	1,878	4,210,399	160,312	4,685,311	685,571	985,423	124,791	1,403,014	217,933	3,416,133	72.9	1,269,178	966,518	449,582	—270,529
Atlanta & West Point	July	93	108,759	14,516	137,864	19,124	22,224	6,845	48,761	6,439	105,396	76.4	32,468	26,649	11,516	—37,002
	7 mos.	93	534,642	96,965	738,936	128,734	158,591	47,574	326,506	46,161	721,026	97.6	17,910	—35,026	—122,185	—194,346
Western of Alabama	July	133	76,877	14,650	101,387	20,386	27,245	6,659	41,861	6,373	104,044	102.6	—2,657	—10,093	—4,097	—26,629
	7 mos.	133	541,929	104,408	722,490	138,676	199,076	47,868	284,613	47,238	728,339	100.8	—5,849	—57,833	—28,147	—134,470
Atlanta, Birmingham & Coast	July	639	259,281	5,903	291,255	35,676	48,596	19,436	98,553	14,733	226,759	77.9	64,496	50,736	39,583	—87,842
	7 mos.	639	1,327,308	25,712	1,548,407	262,297	289,362	136,608	631,129	105,155	1,498,263	96.8	50,144	—46,497	—128,600	—548,267
Atlantic Coast Line	July	5,144	2,045,855	227,107	2,515,949	348,935	663,211	106,695	1,069,604	120,500	2,320,019	92.2	195,930	—4,561	16,127	—635,369
	7 mos.	5,144	19,029,038	2,919,433	24,424,648	2,788,005	4,271,644	773,156	8,233,432	900,839	17,135,925	70.2	7,288,723	4,334,039	3,380,784	231,247
Charleston & Western Carolina	July	342	181,174	1,344	187,119	21,347	19,940	5,996	51,265	4,510	103,058	55.1	84,061	67,019	70,364	9,901
	7 mos.	342	1,111,544	6,930	1,147,884	149,314	143,385	39,787	357,297	32,637	722,420	62.9	425,464	308,220	299,630	90,467
Baltimore & Ohio	July	6,403	11,801,035	985,744	13,461,167	1,028,127	2,248,934	323,181	3,779,283	551,255	8,031,366	59.7	5,429,801	4,713,647	4,232,308	1,641,586
	7 mos.	6,403	60,418,895	5,080,101	70,115,254	5,299,041	11,696,314	2,273,816	23,965,542	3,733,842	47,558,672	67.8	22,556,582	17,683,876	15,271,273	10,683,758
Baltimore & Ohio Chic. Term.	July	84	.....	.....	285,034	23,029	35,535	1,526	131,109	10,434	206,986	72.6	78,048	31,322	112,139	80,112
	7 mos.	84	.....	.....	1,750,841	125,574	265,661	10,380	923,765	88,533	1,447,616	82.7	303,225	61,150	657,079	568,154
Staten Island Rapid Transit	July	23	45,170	98,271	152,794	10,945	15,642	1,658	76,238	12,421	116,904	76.5	35,890	22,340	6,168	12,139
	7 mos.	23	347,498	588,618	986,111	52,671	86,136	11,626	528,123	83,378	761,934	77.3	224,177	122,712	11,924	3,713
Bangor & Aroostook	July	603	170,046	11,017	197,475	85,540	73,678	4,218	84,352	21,682	270,332	136.9	—72,857	—84,297	—69,085	—91,077
	7 mos.	615	3,445,091	125,326	3,709,536	569,767	576,282	30,292	772,453	162,116	2,115,742	57.0	1,593,794	1,251,098	1,212,874	1,374,854
Belt Ry. of Chicago	July	54	.....	.....	413,940	31,630	31,595	2,289	159,224	7,919	232,657	56.2	181,283	139,321	167,688	149,734
	7 mos.	54	.....	.....	2,229,733	140,547	207,086	17,324	990,609	64,956	1,420,522	63.7	809,211	513,886	967,366	624,325
Bessemer & Lake Erie	July	225	958,153	767	971,135	67,059	132,777	10,924	132,521	30,403	373,589	38.5	597,546	575,044	558,165	—52,343
	7 mos.	225	3,001,206	5,403	3,063,717	268,518	1,041,572	70,646	682,052	222,120	2,284,681	74.6	779,036	613,267	666,963	—769,306
Boston & Maine	July	2,081	2,726,317	635,605	3,881,123	407,000	538,437	56,954	1,360,159	168,726	2,538,396	65.4	1,342,727	1,097,791	920,777	455,911
	7 mos.	2,081	16,250,280	3,803,968	23,636,645	2,795,821	3,487,094	414,737	9,154,441	1,183,285	17,083,479	72.3	6,553,166	4,978,569	4,014,793	4,076,252
Brooklyn, Eastern Dist. Terminal	July	11	93,239	.....	95,013	5,051	12,692	407	24,254	5,663	48,067	50.6	46,946	40,872	41,152	17,306
	7 mos.	11	527,970	.....	536,119	33,542	58,582	1,952	156,452	44,212	294,740	55.0	241,379	197,935	198,215	157,856
Burlington-Rock Island	July	280	65,349	952	70,359	9,623	2,994	2,949	34,855	7,246	57,667	82.0	12,692	9,057	1,331	—40,069
	7 mos.	280	443,320	4,794	474,304	71,172	58,684	21,446	246,106	50,222	447,630	94.4	26,674	—7,043	—74,444	—141,991
Cambria & Indiana	July	37	109,692	.....	109,889	10,985	35,715	378	11,887	7,881	66,846	60.83	43,043	21,308	93,759	41,068
	7 mos.	37	704,510	.....	705,907	55,529	278,127	2,664	83,565	54,772	474,657	67.24	231,250	130,098	536,201	434,274
Canadian Pac. Lines in Maine	July	233	54,416	17,232	80,410	39,131	17,996	4,447	38,993	3,823	104,390	129.8	—23,980	—29,980	—44,424	—58,45
	7 mos.	233	838,510	103,081	1,012,477	185,691	192,764	29,828	410,160	26,126	844,569	83.4	167,908	115,897	—34,833	—136,2
Canadian Pac. Lines in Vermont	July	85	59,118	14,272	90,916	22,337	17,727	2,013	49,826	2,443	94,346	103.8	—3,430	—8,930	—26,187	—52
	7 mos.	85	329,529	72,848	506,201	109,714	120,616	13,488	344,892	17,667	606,377	119.7	—100,176	—138,679	—257,333	—28
Central of Georgia	July	1,944	1,070,228	87,697	1,257,768	144,115	243,211	48,537	438,585	65,093	941,864	74.9	315,904	245,543	203,200	—13
	7 mos.	1,944	5,740,624	580,134	7,092,354	877,097	1,465,930	337,960	2,813,188	472,252	5,994,450	84.5	1,097,904	499,916	298,210	—2
Central New Jersey	July	691	1,743,036	456,740	2,337,213	170,441	432,624	46,408	932,378	89,299	1,682,817	72.0	654,396	130,004	50,779	—
	7 mos.	691	11,771,288	2,477,301	15,267,313	1,092,785	2,862,918	291,190	6,239,361	651,731	11,222,758	73.5	4,044,555	1,932,973	1,397,290	1,
Central Vermont	July	457	413,824	43,445	506,678	79,722	67,357	14,201	189,949	19,435	370,679	73.2	135,999	120,417	102,919	
	7 mos.	457	2,271,303	239,901	2,819,873	523,769	563,269	97,696	1,251,601	139,703	2,576,264	91.4	243,609	134,265	94,148	
Chesapeake & Ohio	July	3,153	10,176,601	227,589	10,775,788	1,339,582	1,803,565	181,635	2,026,181	275,099	5,637,121	52.3	5,138,667	4,156,987	4,019,067	1
	7 mos.	3,147	54,982,380	1,384,743	58,477,407	6,746,717	10,583,243	1,131,525	13,015,871	1,953,344	33,508,531	57.3	24,968,876	19,451,989	18,749,948	15
Chicago & Eastern Illinois	July	938	873,831	142,075	1,121,524	122,913	142,783	43,980	428,407	51,766	795,559	70.9	325,965	250,569	118,319	—
	7 mos.	938	5,360,554	614,766	6,643,515	842,058	947,083	346,728	2,904,150	377,684	5,456,028	82.1	1,187,487	609,766	—240,378	—

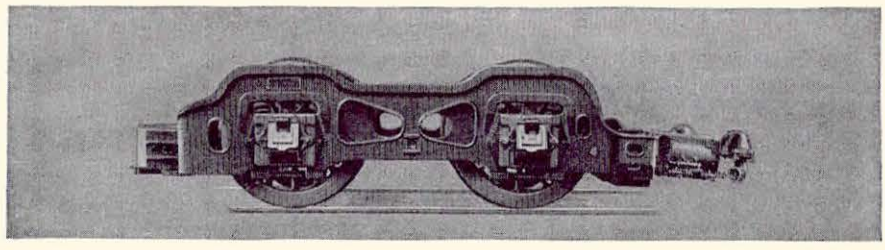
Continued on next left-hand page

A Despatcher BOOSTS The Locomotive BOOSTER

"Before the Boosters were applied, despatching was a nightmare even with four tracks. When a train stopped there was no telling when it would get going again, principally because of broken drawbars. Picture a despatcher with two or three long drags lining up for a water stop, blocking the crossovers, a high-ball passenger coming in behind them, and the head man suddenly reporting a couple of draw heads out in widely separated sections of his train. Since the installation of the Boosters, such situations are a thing of the past. Trains can be moved with a sureness and certainty that was never known before."



The Locomotive Booster supplies the extra power that keeps trains out of trouble and improves operating economy.



FRANKLIN RAILWAY SUPPLY COMPANY, INC.

NEW YORK CHICAGO MONTREAL

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Chicago & Illinois Midland	July	131	$274,820	$904	$283,541	$26,499	$42,940	$14,690	$59,842	$14,960	$159,640	56.3	$123,901	$103,230	$107,289	—$45,165
	7 mos.	131	1,609,044	7,022	1,667,332	160,069	311,178	108,757	401,588	106,795	1,090,701	65.4	576,631	505,074	534,086	76,744
Chicago & North Western	July	8,442	5,944,707	998,024	7,681,029	944,611	1,171,486	180,669	2,468,099	263,483	5,061,768	65.9	2,619,261	2,068,096	1,803,307	—512,676
	7 mos.	8,442	31,022,266	4,916,419	40,331,369	5,581,798	8,563,628	1,065,156	15,974,588	1,856,686	33,233,036	82.4	7,098,333	2,965,121	1,360,743	—1,472,845
Chicago, Burlington & Quincy	July	9,248	6,186,803	852,202	7,788,511	782,102	973,378	225,495	2,338,715	283,102	4,648,464	59.7	3,140,047	2,509,046	2,215,867	—13,420
	7 mos.	9,248	33,738,513	3,465,816	41,943,494	4,078,610	6,696,913	1,435,336	15,335,593	1,975,515	29,802,304	71.1	12,141,190	7,471,683	5,479,646	4,437,071
Chicago Great Western	July	1,499	1,342,090	39,277	1,457,938	174,464	166,448	49,228	470,867	46,913	907,764	62.3	550,174	483,515	285,498	—91,884
	7 mos.	1,499	7,234,750	285,406	8,050,106	1,099,277	1,144,466	347,246	3,103,929	327,761	6,015,897	74.7	2,034,209	1,594,581	283,980	358,894
Chicago, Indianapolis & Louisville	July	647	525,189	53,082	648,792	58,159	159,498	23,700	257,761	20,734	519,164	80.0	129,628	98,539	5,546	—83,751
	7 mos.	647	3,242,584	300,908	4,021,906	352,439	931,182	150,451	1,724,874	156,101	3,340,833	83.1	681,073	427,292	—183,081	—418,836
Chicago, Mil., St. Paul & Pacific	July	11,207	7,144,076	548,043	8,413,060	1,205,502	1,575,357	194,379	2,725,505	253,857	5,986,010	71.2	2,427,050	1,790,100	1,359,143	—1,177,139
	7 mos.	11,237	40,367,234	2,985,082	47,904,249	4,920,748	9,763,983	1,395,463	17,957,349	1,785,622	36,014,100	75.2	11,890,149	7,278,563	4,285,721	—4,104,371
Chicago River & Indiana	July	20	.....	.....	422,048	20,000	20,000	1,438	118,127	9,462	169,027	40.0	253,021	227,427	285,589	190,396
	7 mos.	20	.....	.....	2,532,235	91,500	151,000	10,160	784,740	70,717	1,108,117	43.8	1,424,118	1,257,766	1,646,688	1,393,256
Chicago, Rock Island & Pacific	July	7,611	4,997,643	472,133	5,976,126	732,414	1,265,985	162,847	2,040,512	257,347	4,523,194	75.7	1,452,932	996,303	727,525	374,513
	7 mos.	7,611	28,808,765	3,001,463	35,193,947	3,333,864	7,165,220	1,169,045	13,979,964	1,770,577	27,805,235	79.0	7,388,712	4,137,753	2,212,405	1,655,306
Chicago, Rock Island & Gulf	July	721	300,580	26,285	330,982	56,917	32,423	14,547	99,254	18,217	223,766	67.6	107,216	87,114	—453	101,465
	7 mos.	721	1,841,762	129,581	1,968,531	245,047	227,008	102,154	690,483	125,686	1,407,070	71.5	561,461	414,724	—138,406	347,056
Chic., St. Paul, Minn. & Omaha	July	1,691	1,319,632	138,421	1,562,369	136,000	231,554	32,823	551,785	64,559	1,027,882	65.8	534,487	452,627	369,494	—122,670
	7 mos.	1,717	6,729,086	739,325	8,076,673	831,012	1,256,123	220,317	3,614,428	458,811	6,432,287	79.6	1,644,386	1,090,282	611,818	—589,896
Cinn. Union Terminal	July	45	.....	.....	3,979	10,251	5,667	.....	78,754	5,512	100,184	2,517.9	—96,205	—125,241	—122,527	.....
	7 mos.	45	.....	.....	17,306	41,528	21,831	.....	325,710	24,898	413,967	2,392.0	—396,661	—509,935	—510,938	.....
Clinchfield	July	309	468,695	2,292	475,191	39,388	93,409	15,406	73,275	14,888	236,366	49.7	238,825	183,820	202,818	—28,141
	7 mos.	309	2,675,472	13,131	2,720,366	238,973	575,362	107,345	463,206	92,812	1,477,698	54.3	1,242,668	857,425	948,158	279,020
Colorado & Southern	July	1,029	357,937	29,856	432,868	62,634	82,772	11,399	153,938	31,118	342,566	79.1	90,302	33,428	16,384	—103,796
	7 mos.	1,029	2,189,742	149,767	2,639,777	325,417	638,614	81,013	1,105,241	222,692	2,372,160	89.9	267,617	—140,365	—242,684	—371,939
Ft. Worth & Denver City	July	804	532,963	32,880	618,880	35,552	66,255	15,198	126,916	30,349	276,197	44.6	342,683	314,168	284,769	284,359
	7 mos.	804	2,396,491	188,714	2,995,710	188,765	460,556	106,221	902,176	223,500	1,889,173	63.1	1,106,537	894,039	726,767	726,846
Columbus & Greenville	July	167	60,648	4,350	70,422	9,721	12,413	3,048	23,076	7,681	55,939	79.4	14,483	12,460	15,844	—21,870
	7 mos.	167	341,397	23,284	397,783	73,108	64,295	19,670	159,312	55,099	371,484	93.4	26,299	15,101	30,959	—36,152
Conemaugh & Black Lick	July	20	49,355	.....	91,194	7,989	14,039	424	36,989	3,176	62,617	68.7	28,577	28,277	29,131	—6,026
	7 mos.	20	145,062	.....	285,335	36,727	56,641	2,106	133,053	18,881	247,408	86.7	37,927	35,827	43,824	—40,726
Delaware & Hudson	July	848	1,783,194	115,864	2,011,827	280,176	484,781	58,382	748,279	136,459	1,711,291	85.1	300,536	219,722	208,585	—130,737
	7 mos.	852	10,418,306	585,392	11,759,425	1,883,692	3,401,896	347,245	5,108,325	954,805	11,704,207	99.5	55,218	—518,855	—476,341	—215,396
Delaware, Lackawanna & Western	July	998	2,847,662	603,601	3,913,795	355,767	639,273	111,825	1,517,049	143,918	2,802,086	71.6	1,111,709	665,468	633,904	98,897
	7 mos.	998	17,381,908	3,694,795	24,416,493	2,162,831	4,930,358	761,549	10,671,702	1,052,724	19,768,008	81.0	4,648,485	1,739,795	1,501,421	2,036,568
Denver & Rio Grande Western	July	2,513	1,139,637	103,363	1,330,721	173,109	303,788	40,807	394,219	67,421	985,218	74.0	345,503	210,174	196,485	57,781
	7 mos.	2,513	7,288,822	478,111	8,333,930	911,459	2,048,387	303,590	2,798,335	502,680	6,586,609	79.0	1,747,321	748,228	778,333	134,721
Denver & Salt Lake	July	232	90,088	3,879	104,542	19,935	19,576	1,507	22,009	11,207	66,306	63.4	38,236	25,202	42,983	9,363
	7 mos.	232	641,239	31,504	746,211	119,478	151,599	10,404	158,926	78,653	495,890	66.5	250,321	154,019	229,163	261,723
Detroit & Mackinac	July	242	41,226	3,243	51,670	12,534	8,693	810	20,730	5,308	48,040	92.9	3,630	—1,434	—1,539	9,075
	7 mos.	242	261,913	14,176	319,885	75,063	52,899	6,748	146,389	26,057	306,668	95.8	13,217	—5,750	—7,035	5,018
Detroit & Toledo Shore Line	July	50	227,566	.....	229,194	22,143	19,891	6,109	53,691	2,955	104,775	45.7	124,419	91,428	48,390	—13,282
	7 mos.	50	1,455,420	.....	1,464,917	126,494	135,684	46,130	371,003	49,101	728,371	49.7	736,546	584,833	307,822	169,306
Detroit Terminal	July	19	.....	.....	65,201	5,677	7,440	7	31,966	2,396	47,486	72.8	17,715	5,651	9,855	—18,546
	7 mos.	19	.....	.....	383,209	31,370	52,329	7	202,610	18,009	304,325	79.4	78,884	293	—3,065	—66,934
Detroit, Toledo & Ironton	July	472	364,552	243	382,344	40,297	59,555	9,090	94,423	15,916	217,018	56.8	165,326	137,819	127,269	47,657
	7 mos.	472	2,098,406	2,304	2,177,455	201,562	367,549	64,171	603,107	122,255	1,347,823	61.9	829,632	606,057	524,469	384,197
Duluth, Missabe & Northern	July	563	1,250,699	4,326	1,410,352	101,567	124,300	2,377	201,523	42,756	472,491	33.5	937,861	865,085	866,907	22,433
	7 mos.	563	2,771,857	12,768	3,167,653	597,513	884,148	20,257	973,491	281,177	2,756,554	87.0	411,099	168,744	171,002	—2,025,266
Duluth, Winnipeg & Pacific	July	178	71,480	2,687	77,274	17,701	12,576	2,286	31,537	4,216	68,042	88.1	9,232	5,079	18,886	—24,005
	7 mos.	178	385,354	13,053	417,699	132,756	122,374	16,265	225,701	29,821	526,461	126.0	—108,762	—130,747	—10,516	—4,037
Elgin, Joliet & Eastern	July	446	999,649	2	1,160,370	93,473	219,785	11,321	360,496	39,571	724,614	62.4	435,756	328,951	273,150	—179,484
	7 mos.	446	4,878,012	8	5,353,359	514,041	1,157,520	79,595	1,982,632	301,026	4,034,553	75.4	1,318,806	599,980	318,744	—696,980
Erie Railroad	July	2,046	5,211,306	488,994	6,111,282	562,797	1,202,085	134,390	1,961,444	225,912	4,094,189	67.0	2,017,093	1,671,853	1,565,979	123,130
	7 mos.	2,046	29,298,233	2,982,039	35,199,752	3,238,083	7,513,924	913,366	12,831,366	1,616,607	26,175,423	74.4	9,024,329	6,620,226	5,920,233	[illegible]24,538

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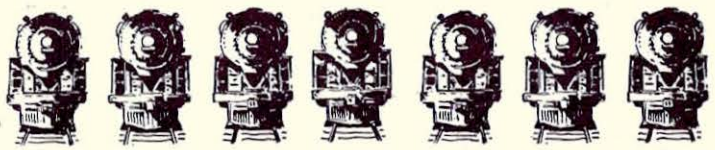
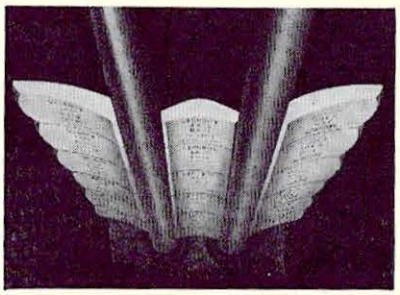
Is *your* ARCH BRICK *backed up by* SERVICE ?



Arch Brick supply consists of more than just Arch Brick manufacture.

Manufacture cannot stand alone. It must be built upon a foundation of railroad experience and combustion knowledge combined with a seasoned service of supply.

For a quarter of a century, locomotive combustion and its relation to Arch Brick has been the study of the American Arch Company. Designs have been constantly improved so that today the Locomotive Arch performs more efficiently than ever before. This has been the achievement of the American Arch Company. Then, too, during this time, it has perfected the special service that keeps the railroad supplied with Arch Brick of proper quality and type at all points of consumption.



There's More to Security Arches Than Just Brick

HARBISON-WALKER REFRACTORIES CO.

Refractory Specialists

NRA MEMBER U.S. WE DO OUR PART

AMERICAN ARCH CO.
INCORPORATED

Locomotive Combustion Specialists » » »

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Chicago & Erie	July	269	$791,728	$45,375	$889,000	$90,817	$96,312	$22,548	$200,471	$31,626	$441,737	49.7	$447,263	$411,423	$199,015	—$40,491
	7 mos.	269	4,534,330	140,422	4,995,296	517,790	625,096	155,814	1,322,410	225,304	2,844,091	56.9	2,151,205	1,900,030	535,766	—102,192
New Jersey & New York	July	45	19,679	57,630	79,034	7,954	25,356	1,291	44,428	4,003	83,032	105.1	—3,998	—8,999	—26,710	—20,866
	7 mos.	45	111,125	441,697	565,620	53,588	169,812	9,655	329,477	24,326	586,858	103.8	—21,238	—56,304	—185,372	—144,526
N. Y., Susquehanna & Western	July	131	243,017	27,306	284,128	32,666	48,076	4,189	99,545	11,363	195,833	68.9	88,295	58,109	45,736	13,157
	7 mos.	131	1,532,511	190,611	1,818,759	178,629	341,653	30,013	717,604	74,561	1,342,452	73.8	476,307	264,532	167,443	199,073
Florida East Coast	July	839	159,860	46,271	243,933	114,914	118,952	17,040	123,355	36,985	413,831	169.6	—169,898	—246,488	—269,799	—289,648
	7 mos.	839	3,128,925	1,048,068	4,708,399	726,748	902,351	137,580	1,206,400	273,887	3,283,068	69.7	1,425,331	896,882	575,657	202,234
Fort Smith & Western	July	249	40,158	915	44,534	11,432	7,225	4,400	16,938	3,761	43,903	98.6	631	—1,864	—6,539	—16,576
	7 mos.	249	317,436	6,056	349,862	87,935	63,791	30,198	126,247	28,138	337,357	96.4	12,505	—3,887	—31,068	—81,658
Galveston Wharf	July	11	.....	.....	94,084	24,465	3,420	3,426	20,470	4,378	59,867	63.6	34,217	16,357	16,411	14,669
	7 mos.	11	.....	.....	623,653	210,746	23,416	22,182	139,161	39,532	461,811	74.0	161,842	23,869	24,139	212,092
Georgia R. R.	July	329	259,123	14,614	290,918	26,256	42,945	16,391	109,793	11,821	207,746	71.4	83,172	78,280	88,648	30,112
	7 mos.	329	1,558,148	83,564	1,772,030	194,458	310,428	112,542	760,296	86,550	1,465,779	82.7	306,251	267,600	323,261	90,010
Georgia & Florida	July	463	80,600	1,607	86,492	17,087	14,953	7,868	31,575	5,786	77,426	89.5	9,066	4,066	6,675	—23,414
	7 mos.	463	468,161	8,114	507,807	110,671	98,567	56,071	217,329	43,596	527,141	103.8	—19,334	—54,540	—60,921	—148,646
Grand Trunk Western	July	1,008	1,254,867	64,742	1,409,818	263,038	284,463	35,257	558,312	75,959	1,220,391	86.6	189,427	116,270	3,645	—280,989
	7 mos.	1,003	7,850,085	338,911	8,795,242	1,419,451	1,939,442	250,880	3,818,284	538,059	7,982,865	90.8	812,377	224,979	—457,994	—1,240,897
Canadian Natl. Lines in New Eng.	July	172	75,869	8,744	94,794	26,436	21,059	2,991	46,786	9,079	106,772	112.6	—11,978	—20,267	—59,603	—87,639
	7 mos.	172	454,380	46,356	569,144	128,408	120,287	21,389	358,473	60,718	698,051	122.6	—128,907	—221,975	—475,752	—549,209
Great Northern	July	8,452	4,985,416	461,643	5,955,504	598,076	950,167	157,527	1,641,953	206,060	3,610,913	60.6	2,344,591	1,734,371	1,581,185	—980,581
	7 mos.	8,453	25,700,662	2,052,905	30,687,362	2,649,612	6,173,683	1,099,951	11,071,807	1,330,248	22,587,609	73.6	8,099,753	4,153,602	3,037,703	—4,063,561
Green Bay and Western	July	234	106,372	942	111,489	20,024	14,754	4,515	39,205	2,412	80,910	72.5	30,579	25,037	22,279	—4,367
	7 mos.	234	597,236	6,287	624,599	130,899	88,276	30,717	270,334	18,126	538,084	86.1	86,515	46,449	32,099	15,932
Gulf & Ship Island	July	307	68,110	5,724	80,583	16,532	12,363	1,871	35,260	4,360	70,372	87.3	10,211	—7,007	—15,751	—34,263
	7 mos.	307	518,212	41,578	630,281	83,561	103,388	13,950	284,419	27,810	514,413	81.6	115,868	—9,694	—87,284	—179,260
Gulf, Mobile & Northern	July	963	395,305	17,332	429,594	45,324	55,159	18,392	118,985	15,085	252,945	58.88	176,649	145,949	107,902	—37,004
	7 mos.	762	1,860,247	57,746	2,020,352	245,648	303,418	139,562	625,631	110,661	1,424,920	70.53	595,432	438,507	274,363	—149,087
Illinois Central	July	5,014	5,791,363	823,122	7,117,506	537,016	1,326,861	151,919	2,309,658	314,429	4,674,795	65.7	2,442,711	2,023,635	1,808,980	680,879
	7 mos.	5,014	34,386,136	4,269,894	42,459,826	2,958,759	8,467,750	1,058,954	15,540,240	1,984,981	30,210,541	71.2	12,249,285	9,068,568	8,077,906	5,658,594
Yazoo & Mississippi Valley	July	1,673	777,741	70,143	906,991	79,831	131,583	18,700	376,495	46,282	649,442	71.6	257,549	151,372	52,473	—63,858
	7 mos.	1,673	5,456,081	356,141	6,291,625	410,035	897,532	140,080	2,585,612	284,161	4,317,473	68.6	1,974,152	1,136,840	428,820	—201,747
Illinois Central System	July	6,687	6,569,104	893,265	8,024,497	616,847	1,458,444	170,619	2,686,153	360,711	5,324,237	66.3	2,700,260	2,175,007	1,861,453	617,021
	7 mos.	6,687	39,842,217	4,626,035	48,751,451	3,368,794	9,365,282	1,199,034	18,125,852	2,269,142	34,528,014	70.8	14,223,437	10,205,408	8,506,726	5,456,847
Illinois Terminal	July	537	371,127	48,583	432,651	63,144	44,878	14,728	141,635	15,376	279,164	64.52	153,487	128,430	92,332	21,641
	7 mos.	541	2,186,062	330,934	2,604,170	302,979	331,586	99,689	966,515	117,815	1,817,350	69.79	786,820	618,629	414,750	294,243
Kansas City Southern	July	783	616,354	16,372	729,389	76,825	129,354	39,017	215,334	60,562	522,100	71.6	207,289	130,953	109,587	10,236
	7 mos.	783	4,146,947	94,448	4,843,279	481,199	843,912	274,848	1,505,811	416,316	3,528,568	72.9	1,314,711	780,609	625,177	424,858
Texarkana & Fort Smith	July	98	76,531	1,302	91,935	10,431	10,568	5,785	25,536	8,760	61,546	66.9	30,389	22,769	4,288	3,295
	7 mos.	98	456,629	7,265	555,792	54,209	55,140	38,594	171,320	57,585	382,315	68.8	173,477	119,759	—3,930	1,788
Kansas, Oklahoma & Gulf	July	326	146,520	352	149,474	18,509	7,908	7,088	33,675	7,300	74,480	49.8	74,994	58,102	40,762	15,413
	7 mos.	326	963,256	2,024	983,978	108,167	77,063	47,015	238,547	53,326	523,857	53.2	460,121	342,546	245,761	192,389
Lake Superior & Ishpeming	July	160	279,703	77	322,656	25,113	14,235	733	40,633	6,217	86,909	26.9	235,747	198,286	197,014	—39,028
	7 mos.	160	557,959	523	633,490	123,027	88,090	3,691	143,403	38,915	397,104	62.7	236,386	142,504	135,710	—297,050
Lake Terminal	July	12	.....	.....	92,616	5,592	6,350	.....	31,050	2,534	45,526	49.2	47,090	44,099	46,402	22,454
	7 mos.	12	.....	.....	328,009	25,615	31,801	.....	127,456	17,773	202,645	61.8	125,364	104,369	110,093	—4,126
Lehigh & Hudson River	July	96	126,452	405	132,272	10,779	17,901	3,339	38,289	6,141	76,449	57.8	55,823	43,293	28,571	10,256
	7 mos.	96	761,859	2,046	814,013	70,585	135,197	22,983	275,858	44,060	548,683	67.4	265,330	184,586	101,151	50,969
Lehigh & New England	July	228	300,738	480	303,913	34,278	57,956	4,366	90,567	14,840	202,007	66.5	101,906	87,837	81,917	41,881
	7 mos.	228	1,687,004	2,975	1,705,148	204,528	356,251	34,421	618,061	111,417	1,324,664	77.7	380,484	316,531	362,101	386,647
Lehigh Valley	July	1,359	2,909,444	226,344	3,358,483	307,060	646,629	108,525	1,332,700	122,125	2,536,575	75.5	821,908	651,470	537,482	—196,047
	7 mos.	1,360	18,001,788	1,284,423	20,991,289	1,674,904	4,490,226	746,360	9,135,025	859,538	17,006,185	81.0	3,985,104	2,346,333	1,558,728	1,268,882
Louisiana, Arkansas	July	608	318,137	13,141	353,230	72,856	55,297	18,548	82,534	15,507	245,227	69.4	108,003	86,427	72,701	42,541
	7 mos.	608	2,119,794	55,877	2,337,002	304,563	401,401	136,506	551,113	121,234	1,513,727	64.8	823,275	618,258	501,660	349,006
Louisville, Arkansas & Texas	July	255	73,975	532	80,959	18,285	8,482	4,177	24,136	4,935	59,977	74.1	20,982	18,482	8,377	—13,920
	7 mos.	255	415,409	1,891	458,147	116,778	53,880	23,730	165,733	31,334	391,563	85.5	66,584	50,257	—22,557	—56,860

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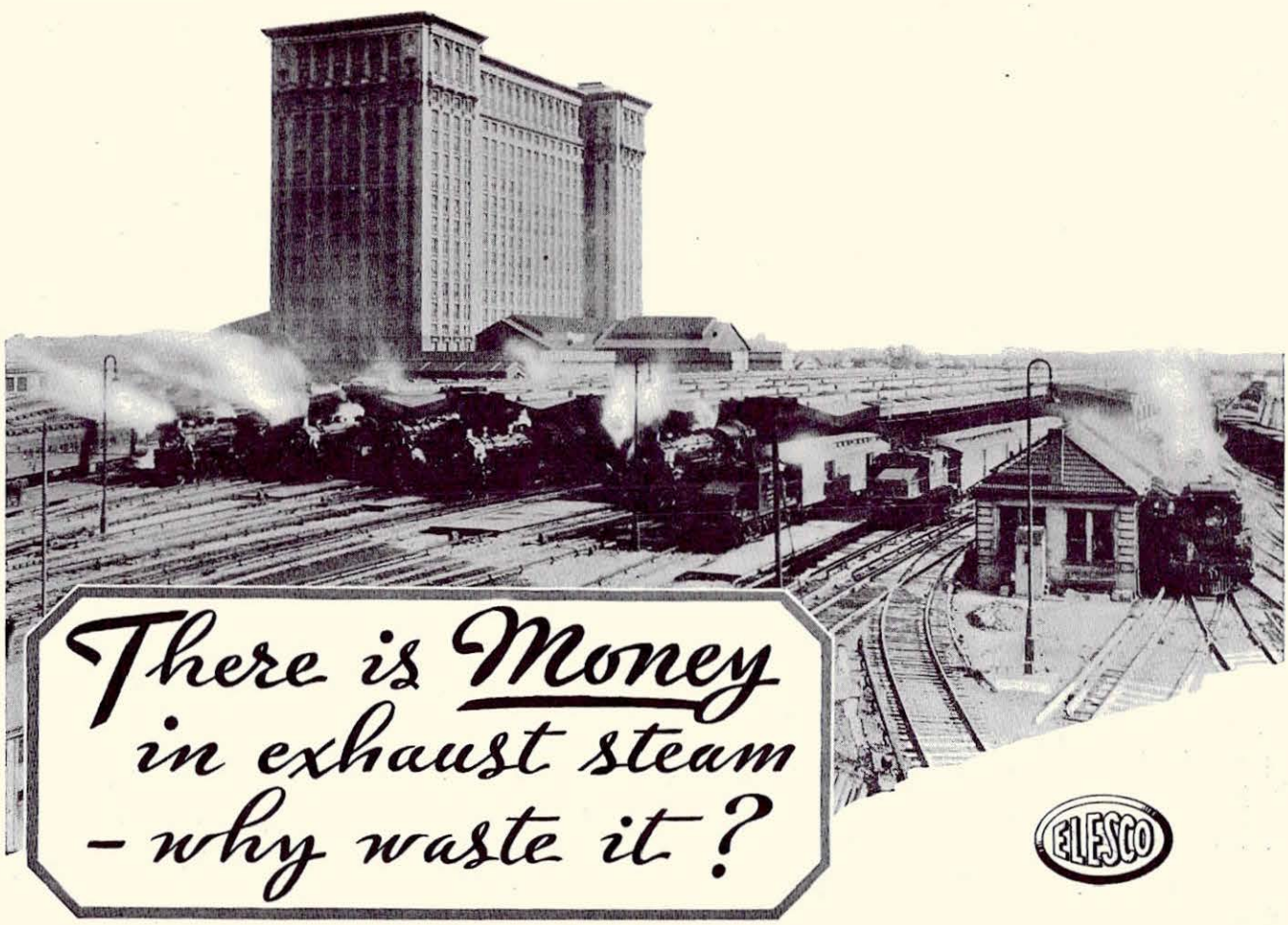

There is Money in exhaust steam — why waste it?

ELESCO

The heat in waste exhaust steam is generated in the firebox from fuel which costs money. If some of that heat is reclaimed, just so much less heat is required from the firebox — and so much money saved.

That is exactly what an Elesco feed water heater does — reclaims the heat in a portion of the exhaust steam and passes it into the boiler as hot feed water . . . thus, for the same capacity, reducing fuel consumption in proportion, equivalent to approximately 15 per cent.

That is a direct saving. But, with the same fuel rate, Elesco feed water heaters increase the sustained boiler capacity and increase the power due to reduced back pressure, directly in proportion to the amount of exhaust steam condensed by the heater.

In these ways, Elesco feed water heaters are saving the money in exhaust steam on almost 4,000 locomotives. LET US SEND YOU PARTICULARS.

THE ELESCO FEED WATER HEATER

THE SUPERHEATER COMPANY

Representative of AMERICAN THROTTLE COMPANY, INC.

60 East 42nd Street
New York

Peoples Gas Building
Chicago

Canada: THE SUPERHEATER COMPANY, LTD., MONTREAL

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Superheaters Feed Water Heaters . Exhaust Steam Injectors . Superheated Steam Pyrometers . American Throttles

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Louisville & Nashville	July	5,125	$5,439,639	$413,524	$6,269,640	$638,407	$1,229,869	$157,212	$1,988,012	$255,213	$4,301,474	68.6	$1,968,166	$1,574,007	$1,646,606	$216,779
	7 mos.	5,151	31,137,597	2,479,275	36,503,455	4,106,822	7,760,802	1,172,612	13,074,417	1,819,252	28,132,949	77.1	8,370,506	5,716,781	5,834,228	1,201,507
Maine Central	July	1,101	740,370	96,179	934,643	140,596	142,375	11,248	304,034	36,643	634,591	67.9	300,051	253,235	222,703	56,655
	7 mos.	1,115	4,796,651	523,681	5,946,438	813,365	895,903	73,688	2,216,522	263,527	4,262,069	71.7	1,684,369	1,356,650	1,098,738	854,230
Midland Valley	July	363	98,579	432	102,895	16,421	6,321	2,230	25,442	5,861	55,525	54.0	47,370	37,370	32,334	10,226
	7 mos.	363	712,264	2,790	742,264	106,449	66,874	16,083	191,028	46,889	426,529	57.5	315,735	250,494	207,141	185,402
Minneapolis & St. Louis	July	1,627	693,735	15,739	748,204	101,942	126,005	21,599	294,442	30,936	574,900	76.8	173,304	148,105	133,395	—128,714
	7 mos.	1,627	3,883,725	97,046	4,251,013	479,947	911,270	182,472	2,010,907	242,095	3,822,416	89.9	428,597	166,506	21,010	—611,285
Minn., St. Paul & S. S. Marie	July	4,315	1,811,036	144,673	2,129,195	278,747	325,541	61,023	721,086	106,123	1,498,977	70.4	630,218	463,117	325,413	—208,532
	7 mos.	4,327	10,334,817	566,035	11,899,311	1,711,288	2,368,564	425,540	4,997,444	752,049	10,278,007	86.4	1,621,304	557,781	—274,814	—1,881,136
Duluth, South Shore & Atlantic	July	563	187,468	11,065	220,851	28,586	28,265	5,265	66,665	5,644	134,202	60.8	86,649	70,191	67,711	—45,640
	7 mos.	562	865,136	65,381	1,025,130	192,847	205,072	38,433	456,034	41,409	935,337	91.2	89,793	—47,576	—72,994	—329,317
Spokane International	July	163	43,544	1,728	49,441	13,057	4,804	1,989	19,481	3,955	43,286	87.6	6,155	1,286	—1,713	—12,172
	7 mos.	163	209,027	11,079	246,005	79,931	32,229	14,080	131,936	29,062	287,148	116.7	—41,143	—75,103	—88,725	—100,989
Mississippi Central	July	150	51,863	1,624	55,323	6,486	12,441	6,162	15,326	4,993	45,408	82.1	9,915	5,346	1,791	—7,799
	7 mos.	150	314,370	7,815	334,687	60,933	72,703	42,418	106,444	35,469	317,970	95.0	16,717	—3,371	—28,717	—80,245
Missouri & North Arkansas	July	364	77,756	992	85,302	11,000	7,431	4,012	24,627	3,561	50,324	59.0	34,978	33,017	23,772	—11,774
	7 mos.	364	415,449	6,951	464,392	104,099	68,591	35,412	174,166	35,530	417,476	89.9	46,916	29,570	—28,938	—98,317
Missouri-Illinois	July	202	78,840	308	80,883	13,180	8,656	2,594	26,068	5,431	55,929	69.1	24,954	18,094	10,751	5,449
	7 mos.	202	441,063	2,218	454,854	89,360	79,712	17,341	156,894	37,365	380,602	83.7	74,252	29,349	—21,117	12,601
Missouri-Kansas-Texas Lines	July	3,293	1,923,369	168,405	2,288,011	277,161	349,814	100,324	696,318	140,816	1,578,220	69.0	709,791	499,262	323,221	263,753
	7 mos.	3,293	11,177,647	1,009,085	13,592,383	1,848,588	2,237,654	726,335	4,918,726	966,494	10,782,402	79.3	2,809,981	1,426,415	268,108	1,175,166
Missouri Pacific	July	7,412	5,872,115	370,975	6,737,760	788,029	1,194,933	226,154	2,062,780	241,580	4,531,487	67.3	2,206,273	1,859,110	1,433,163	619,638
	7 mos.	7,412	32,573,359	2,056,768	38,082,517	4,506,652	7,597,261	1,454,483	13,885,199	1,763,634	29,257,583	76.8	8,824,934	6,303,310	3,883,920	3,673,246
Gulf Coast Lines	July	1,800	552,127	31,620	620,777	109,636	115,783	39,756	199,469	40,042	502,635	80.97	118,142	65,968	449	53,156
	7 mos.	1,802	4,492,483	197,537	4,974,314	711,108	857,410	269,644	1,596,617	313,659	3,732,021	75.03	1,242,293	890,082	223,126	909,821
International-Great Northern	July	1,159	989,948	61,180	1,122,327	160,041	166,875	26,237	356,057	41,151	756,303	67.39	366,024	327,970	205,273	2,180
	7 mos.	1,159	6,806,286	340,350	7,693,342	927,155	1,251,204	180,730	2,597,882	307,453	5,311,457	69.04	2,381,885	2,120,921	1,175,684	3,919
San Antonio, Uvalde & Gulf	July	316	52,976	2,606	59,185	14,885	8,753	4,078	10,223	3,908	41,789	70.6	17,396	13,317	—5,830	—29,227
	7 mos.	316	368,721	19,607	419,793	100,641	71,073	27,789	119,324	30,186	348,039	82.9	71,754	44,939	—102,835	—19,658
Mobile and Ohio	July	1,201	710,761	26,977	776,881	106,472	178,482	37,422	249,167	36,249	607,842	78.2	169,039	124,427	62,876	—117,164
	7 mos.	1,226	4,197,235	121,939	4,582,351	553,202	951,854	267,419	1,722,374	257,756	3,753,199	81.9	829,152	537,847	104,563	—461,298
Monongahela	July	177	359,790	600	361,872	29,108	20,216	362	59,288	5,023	113,997	31.5	247,875	227,550	151,027	75,899
	7 mos.	177	1,922,058	4,174	1,937,298	143,297	148,104	4,791	381,072	49,781	727,063	37.5	1,210,235	1,103,525	622,546	609,757
Monongahela Connecting	July	6	.....	.....	108,452	13,696	16,334	48	44,771	2,759	77,608	71.6	30,844	25,159	22,436	—23,784
	7 mos.	6	.....	.....	386,982	70,795	103,001	318	206,102	18,504	398,720	103.0	—11,738	—44,188	—43,954	—153,484
Montour	July	57	222,783	.....	224,780	17,528	66,254	1,098	34,884	5,762	125,526	55.8	99,254	96,428	116,544	27,790
	7 mos.	57	981,612	.....	990,422	82,395	254,070	8,200	195,929	46,903	587,497	59.3	402,925	383,760	512,067	299,185
Nashville, Chattanooga & St. Louis	July	1,203	1,068,794	66,531	1,225,011	148,056	261,736	54,699	413,388	53,088	936,892	76.5	288,119	249,519	225,619	38,595
	7 mos.	1,203	6,179,613	421,287	7,302,931	964,543	1,605,537	382,501	2,705,528	377,184	6,066,517	83.1	1,236,414	989,780	869,598	139,654
Nevada Northern	July	165	23,637	620	28,026	8,295	3,954	655	6,235	3,244	22,383	79.9	5,643	—1,878	2,627	—506
	7 mos.	165	115,050	7,845	149,294	59,301	27,673	4,954	49,660	23,059	164,647	110.3	—15,353	—67,089	—36,558	—19,886
Newburgh & South Shore	July	6	.....	.....	36,468	Cr. 543	14,540	.....	16,492	4,356	34,845	95.5	1,622	—6,532	—4,199	—22,907
	7 mos.	6	.....	.....	279,545	21,318	118,077	.....	143,355	31,185	313,935	112.3	—34,391	—95,190	—70,054	—107,035
New Orleans Great Northern	July					(INCLUDED IN GULF, MOBILE & NORTHERN)										
	7 mos.															
New Orleans Terminal	July	20	Dr. 7,582	.....	106,987	9,275	6,307	.....	26,859	1,033	43,474	40.6	63,513	51,643	45,896	13,856
	7 mos.	20	.....	.....	768,754	56,422	39,416	.....	183,718	7,240	286,796	37.3	481,958	401,306	319,371	215,868
New York Central	July	11,435	18,819,682	4,793,520	26,468,195	2,248,661	5,277,213	510,220	8,845,059	991,596	18,208,431	68.8	8,259,764	5,762,324	4,529,619	—161,767
	7 mos.	11,435	108,920,288	28,471,776	157,339,857	13,134,682	31,704,329	3,324,529	57,669,280	6,880,585	114,728,466	72.9	42,611,391	25,480,826	17,023,131	7,323,539
Indiana Harbor Belt	July	120	.....	.....	721,492	18,000	60,000	3,104	267,257	17,013	372,164	51.6	349,328	286,929	226,057	95,075
	7 mos.	120	.....	.....	4,267,887	215,000	405,000	21,731	1,669,612	121,565	2,485,443	58.2	1,782,444	1,439,014	1,080,971	731,637
Pittsburgh & Lake Erie	July	231	1,602,383	48,197	1,697,759	130,236	449,152	23,260	458,110	54,345	1,116,035	65.7	581,724	451,240	548,737	76,483
	7 mos.	233	7,235,971	294,017	7,795,670	587,594	2,567,290	166,175	2,626,090	398,198	6,354,006	81.5	1,441,664	796,415	1,558,126	793,628
New York, Chicago & St. Louis	July	1,690	2,802,553	112,356	3,029,091	269,376	399,497	93,827	923,253	107,049	1,799,772	59.4	1,299,319	1,101,645	783,635	102,351
	7 mos.	1,690	16,103,317	469,542	17,217,142	1,542,816	2,612,796	665,189	5,902,133	772,879	11,510,038	66.9	5,707,104	4,606,090	2,880,329	667,737

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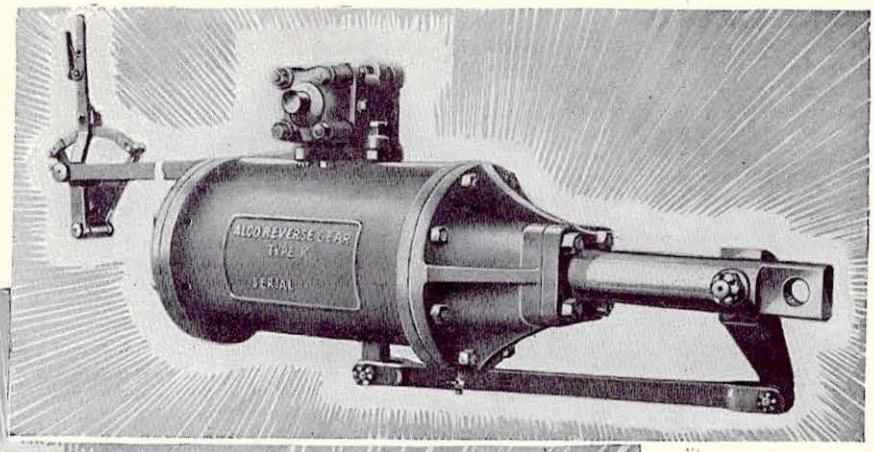
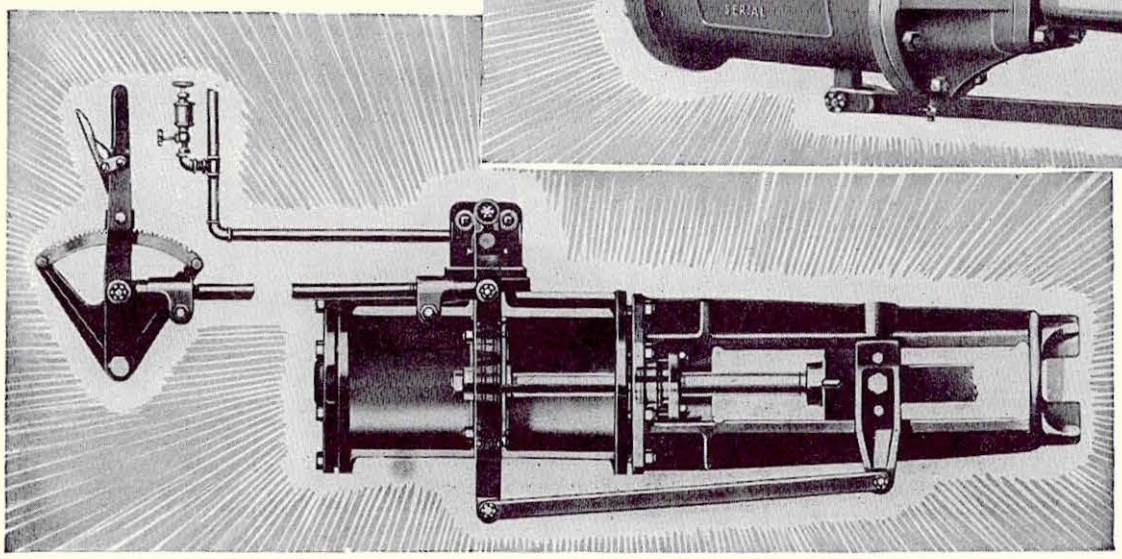
Alco



Type "K" Gear with trunk-piston rod.



Type "G" Gear with crosshead and guides.

REVERSE GEAR FACTS

CYLINDERS are accurately bored, reamed, and honed to a glass finish. They are truly round, not tapered.

Joints between cylinder and cylinder heads are ground — no gaskets used.

Piston rods are ground to size and polished. They are not combined with any part of the piston, but are held in piston by a tapered fit and large nut — same construction as the piston and piston rod on large steam locomotives.

All pins and bushings are hardened and ground to size.

And a hardened steel quadrant, with its 82 notches, permits very small changes in cut-off.

American Locomotive Company
30 Church Street New York N.Y.

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures	Maintenance of Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
New York, New Haven & Hartford	July	2,067	$3,745,027	$1,744,154	$6,075,139	$656,110	$928,234	$68,601	$2,124,702	$216,890	$4,095,231	67.4	$1,979,908	$1,604,667	$1,075,651	$413,797
	7 mos.	2,069	21,683,785	11,610,466	37,839,503	4,369,630	6,229,334	517,995	14,356,423	1,606,891	27,871,974	73.7	9,967,529	7,311,494	3,872,508	6,801,503
New York Connecting	July	20	287,591	.....	293,134	15,852	8,011	.....	28,957	903	53,723	18.3	239,411	208,551	171,964	99,356
	7 mos.	20	1,667,679	.....	1,736,340	83,206	49,536	.....	184,021	6,242	323,005	18.6	1,413,335	1,190,475	903,063	468,063
New York, Ontario & Western	July	568	670,174	140,210	881,774	108,092	131,278	13,220	305,055	23,896	583,017	66.1	298,757	260,757	216,221	117,335
	7 mos.	568	4,627,437	258,582	5,476,985	569,484	968,708	86,608	2,109,654	164,644	3,915,432	71.4	1,561,553	1,273,503	1,026,176	1,025,695
Norfolk & Western	July	2,267	6,493,708	140,134	6,803,261	619,105	1,093,421	108,867	1,314,036	202,489	3,345,868	49.2	3,457,393	2,782,014	2,900,285	1,320,596
	7 mos.	2,235	34,880,552	778,345	36,842,405	3,711,148	7,020,497	767,381	8,618,550	1,474,939	21,661,540	58.8	15,180,865	10,778,197	11,401,777	7,852,046
Norfolk Southern	July	932	340,946	19,357	375,879	64,768	60,544	18,850	141,480	23,516	309,158	82.2	66,721	28,616	15,521	3,611
	7 mos.	932	2,383,391	64,982	2,567,819	488,988	418,486	133,219	995,188	158,638	2,194,519	85.5	373,300	104,076	—2,548	—141,785
Northern Pacific	July	6,747	3,697,422	339,641	4,398 358	478,989	845,004	152,172	1,501,251	235,429	3,273,697	74.4	1,124,661	569,949	834,691	—206,366
	7 mos.	6,740	20,700,934	1,775,420	24,771,591	3,307,607	6,438,174	1,037,405	9,881,601	1,752,999	22,748,390	91.8	2,023,201	—1,706,164	111,797	—1,731,006
Northwestern Pacific	July	407	173,388	109,160	319,297	31,461	47,261	5,175	143,936	14,635	242,011	75.8	77,286	60,197	49,856	16,544
	7 mos.	414	744.017	557,900	1,500,750	232,132	307,514	32,778	887,315	100,621	1,556,947	103.7	—56,197	—209,132	—272,994	—337,121
Oklahoma City-Ada-Atoka	July	132	22,800	186	24,684	4,159	1,030	617	9,400	1,424	16,630	67.4	8,054	4,679	—2,361	—2,416
	7 mos.	132	178,545	1,762	191,106	27,686	10,472	4,259	68,025	10,237	120,675	63.1	70,431	40,701	—5,615	—23,305
Pennsylvania Railroad	July	10,549	23,509,825	4,219,572	30,375,407	2,392,748	5,886,713	532,136	9,710,068	1,240,775	20,041,167	66.0	10,334,240	7,704,247	6,585,615	2,706,792
	7 mos.	10,839	131,400,261	28,876,785	178,646,635	13,802,047	34,536,247	3,549,281	63,546,058	8,691,858	125,751,436	70.4	52,895,199	36,708,793	30,182,492	27,349,443
Long Island	July	399	491,269	1,887,782	2,465,129	137,685	276,096	22,793	849,788	51,686	1,338,797	54.3	1,126,332	817,130	629,930	666,365
	7 mos.	399	3,279,153	9,868,918	13,845,454	967,827	1,890,806	92,899	5,806,096	374,105	9,132,946	66.0	4,712,508	3,452,141	2,236,859	2,776,006
Peoria & Pekin Union	July	18	10,100	.....	83,088	11,109	6,590	1,959	38,789	6,827	65,274	78.6	17,814	—830	31,482	16,653
	7 mos.	18	66,556	.....	495,813	56,972	46,219	12,949	224,578	56,385	397,103	80.1	98,710	—8,646	143,776	123,269
Pere Marquette	July	2,288	1,862,701	84,891	2,065,480	245,379	430,301	58,437	714,796	88,893	1,541,724	74.6	523,756	426,321	327,797	—117,122
	7 mos.	2,307	11,444,613	349,104	12,474,036	1,580,815	2,924,484	388,789	4,795,456	614,981	10,330,990	82.8	2,143,046	1,400,439	770,891	—43,427
Pittsburg & Shawmut	July	102	64,883	162	65,914	8,553	14,448	1,277	17,023	—188	41,113	62.4	24,801	24,076	21,904	10,133
	7 mos.	102	341,018	3,224	348,931	58,944	108,600	9,390	105,940	25,099	307,973	88.3	40,958	36,533	35,975	46,373
Pittsburgh & West Virginia	July	138	289,557	.....	300,705	24,236	55,152	11,350	49,345	11,814	158,968	52.9	141,737	114,023	160,363	40,454
	7 mos.	138	1,387,035	.....	1,466,345	138,919	336,140	78,536	278,026	85,276	965,277	65.8	501,068	340,161	517,130	163,762
Pittsburgh, Shawmut & Northern	July	195	76,087	175	82,636	17,214	14,113	1,182	26,722	6,162	65,393	79.1	17,243	14,681	9,484	—23,875
	7 mos.	196	463,175	1,342	501,475	94,845	114,224	8,767	176,691	46,372	440,899	87.9	60,576	44,559	15,223	—28,349
Reading	July	1,461	4,192,155	225,266	4,620,434	264,613	717,938	69,469	1,486,575	184,902	2,737,846	59.3	1,882,588	1,608,594	1,577,612	649,779
	7 mos.	1,461	24,358,202	1,596,104	27,633,220	1,580,921	5,002,447	479,730	10,254,744	1,280,798	18,706,274	67.7	8,926,946	7,355,551	6,970,966	5,102,563
Atlantic City (changed to Pennsylvania-Reading Seashore Lines)	July	496	247,100	482,583	760,378	46,991	104,045	6,891	415,313	17,641	592,362	77.9	168,016	56,341	—117,012	47,020
	7 mos.	224	653,400	760,310	1,498,405	163,620	197,108	20,120	1,065,829	51,333	1,500,317	100.1	—1,912	—350,161	—578,654	—441,980
Richmond, Fredericksburg & Potomac	July	117	359.629	77,737	509,827	40,960	92,305	7,648	194,734	50,985	391,619	76.8	118,208	19,564	—11,724	10,751
	7 mos.	117	2,282,816	818,997	3,827,166	358,640	661,731	56,729	1,449,128	229,691	2,814,641	73.5	1,012,525	702,630	376,389	392,711
Rutland	July	413	205,553	27,255	302,226	63,018	46,449	9,362	121,564	12,556	252,949	83.7	49,277	26,939	39,795	5,527
	7 mos.	413	1,238,095	204,031	1,911,387	324,023	376,573	69,678	872,141	93,219	1,734,776	90.8	176,611	34,869	122,751	165,217
St. Louis-San Francisco	July	5,266	2,950,297	212,364	3,417,975	576,939	756,530	94,315	1,093,777	138,994	2,672,934	78.20	745,041	437,703	413,536	227,957
	7 mos.	5,266	18,894,945	1,258,390	21,977,234	3,623,405	5,111,719	631,948	7,510,074	982,427	17,878,566	81.35	4,098,668	1,866,876	1,540,866	1,670,947
Fort Worth & Rio Grande	July	233	23,775	1,129	31,403	17,801	10,459	2,271	20,963	3,392	54,873	174.7	—23,470	—27,486	—32,937	—28,186
	7 mos.	233	189,208	7,901	234,758	117,590	83,874	16,250	154,277	24,754	396,495	68.9	—161,737	—190,259	—236,617	—239,160
St. Louis, San Francisco & Texas	July	262	100,414	490	103,856	22,601	19,308	4,644	34,714	7,240	88,507	85.2	15,349	11,385	—14,884	—18,412
	7 mos.	262	555,145	4,329	581,785	159,728	124,354	33,800	234,684	50,964	602,622	103.6	—20,837	—49,130	—236,135	—293,508
St. Louis Southwestern Lines	July	1,884	1,185,101	17,316	1,247,283	115,937	152,135	66,031	357,787	59,274	757,582	60.7	489,701	405,029	242,278	—192,981
	7 mos.	1,902	7,017,048	98,957	7,443,503	805,376	1,009,972	481,280	2,390,400	452,976	5,174,511	69.5	2,268,992	1,731,340	926,537	—175,586
San Diego & Arizona Eastern	July	155	26,973	3,956	31,852	8,165	9,652	1,762	14,221	3,884	38,248	120.1	—6,396	—8,004	—6,318	—2,699
	7 mos.	155	235,631	33,841	281,460	65,504	61,518	12,886	116,170	31,423	291,461	103.6	—10,001	—31,240	—24,837	—223,476
Seaboard Air Line	July	4,373	1,924,378	182,184	2,300,780	355,386	437,422	120,977	905,218	119,231	1,957,880	85.1	342,900	192,629	172,278	—303,517
	7 mos.	4,383	15,861,982	1,404,085	19,117,006	2,843,711	3,692,791	913,998	6,807,674	900,994	15,332,639	80.2	3,784,367	2,305,514	1,650,628	352,277
Southern Railway	July	6,653	6,220,111	651,935	7,398,830	736,833	1,126,353	138,417	2,364,694	242,200	4,643,360	62.8	2,755,470	2,262,201	2,077,694	—392,807
	7 mos.	6,653	36,738,190	3,820,155	44,222,017	4,848,124	8,017,762	1,062,394	15,543,149	1,740,652	31,369,017	70.9	12,853,000	9,437,968	8,346,772	242,184
Alabama Great Southern	July	315	361,303	35,573	424,995	49,927	87,188	10,148	122,716	14,055	285,878	67.3	139,117	100,701	103,405	—53,238
	7 mos.	315	2,068,370	216,494	2,488,052	363,109	571,305	67,806	844,876	99,187	1,959,099	78.7	528,953	280,377	241,860	—317,953
Cinn., New Orleans & Texas Pacific	July	336	1,147,535	57,708	1,260,059	100,697	180,734	22,322	287,872	36,965	632,181	50.2	627,878	521,563	486,955	101,128
	7 mos.	337	5,994,060	342,337	6,714,855	701,847	1,227,743	156,199	1,705,464	256,555	4,073,042	60.7	2,641,813	2,116,099	1,975,749	799,584

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GIVE US A STAYBOLT MATERIAL FOR OVER 200-LB. PRESSURES

THIS was one of the staybolt problems presented to Republic metallurgists for which they found an answer. » » » For more than 10 years, metallurgists and engineers of Republic Steel Corporation and its subsidiaries have been working with railroad men, in different parts of the country, on the development of staybolt materials which will successfully meet the loads imposed upon staybolts by modern pressures, high temperatures and operating speeds. The high vibration and the increasing temperatures in the modern high pressure locomotives have resulted in staybolt troubles which were unknown in the early days. To meet these conditions, new staybolt materials have been developed. » » » Republic's records of laboratory service and tests cover a long series of developments. All this information, together with many service records, will be made available to any railroad official who is interested in improving staybolt performance.

CENTRAL ALLOY DIVISION, MASSILLON, OHIO

Toncan Iron Boiler Tubes, Pipe, Plates, Culverts, Rivets, Staybolts, Tender Plates and Firebox Sheets • Sheets and Strip for special railroad purposes • Agathon Alloy Steels for Locomotive Parts • Agathon Engine Bolt Steel • Agathon Iron for pins and bushings • Agathon Staybolt Iron • Climax Steel Staybolts • Upson Bolts and Nuts • Track Material, Maney Guard Rail Assemblies • Enduro Stainless Steel for dining car equipment, for refrigeration cars and for firebox sheets • Agathon Nickel Forging Steel.

The Birdsboro Steel Foundry & Machine Company of Birdsboro, Pa. has manufactured and is prepared to supply under license, Toncan Copper Molybdenum Iron castings for locomotives.

AGATHON NICKEL IRON

REPUBLIC STEEL CORPORATION

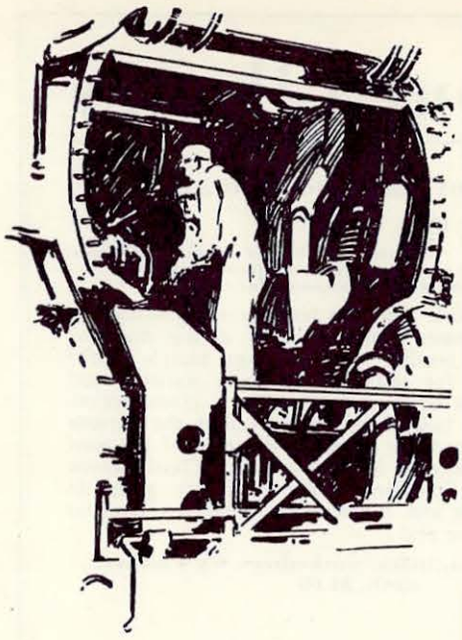
GENERAL OFFICES YOUNGSTOWN, OHIO

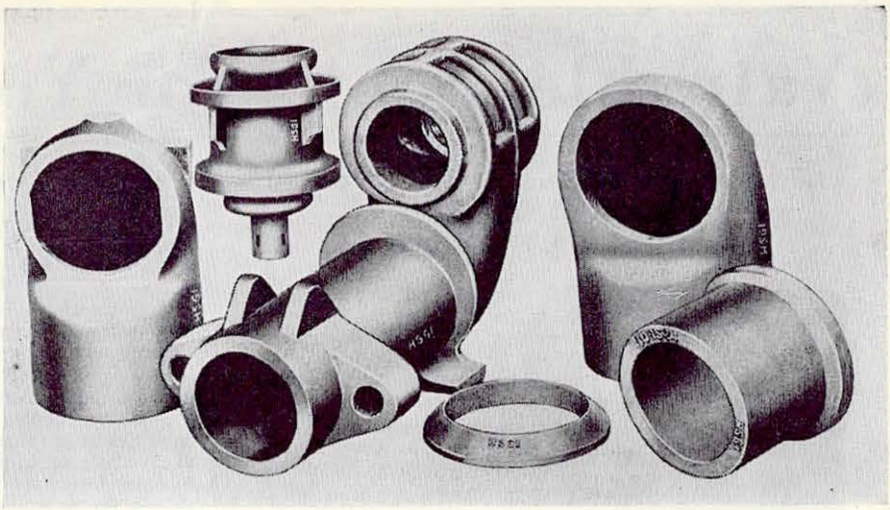
AGATHON STEELS

Revenues and Expenses of Railways

MONTH OF JULY AND SEVEN MONTHS OF CALENDAR YEAR 1933—CONTINUED

Name of road		Av. mileage operated during period	Operating revenues: Freight	Passenger	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures	Equipment	Traffic	Transportation	General	Total	Operating ratio	Net from railway operation	Operating income	Net railway operating income	Net ry. operating income, 1932
Georgia Southern & Florida	July	397	$118,748	$21,417	$155,354	$27,369	$32,634	$1,432	$65,816	$2,164	$131,033	84.3	$24,321	$11,253	$10,542	$34,153
	7 mos.	397	728,438	141,750	991,699	174,757	231,144	13,227	373,088	15,770	822,286	82.9	169,413	68,168	27,266	79,393
New Orleans & Northeastern	July	204	157,524	15,385	183,721	29,425	36,544	5,236	62,186	9,110	143,749	78.2	39,972	8,710	—10,977	—47,851
	7 mos.	204	863,927	96,896	1,040,791	175,340	262,274	36,801	408,992	59,867	951,993	91.5	88,798	—126,942	—238,204	—288,325
Northern Alabama	July	99	43,472	1,233	46,197	5,244	1,241	812	14,128	1,628	23,053	49.9	23,144	18,459	7,051	—13,965
	7 mos.	99	280,797	7,863	299,000	57,690	8,692	7,628	96,741	11,945	182,696	61.1	116,304	84,720	—13,668	—76,656
Southern Pacific	July	9,055	6,913,074	1,365,419	9,069,439	746,929	1,541,741	251,063	3,055,912	494,701	6,262,308	69.0	2,807,131	1,906,132	1,462,773	958,891
	7 mos.	9,087	38,761,730	8,662,087	52,528,968	5,190,714	9,840,208	1,830,888	19,788,185	3,752,352	41,453,854	78.9	11,075,114	4,294,966	2,062,614	3,219,516
Southern Pacific Steamship Lines	July	....	351,874	11,553	382,268	10,088	99,282	17,574	242,574	18,443	387,961	101.5	—5,693	—6,542	—6,674	—65,213
	7 mos.	....	2,150,781	74,938	2,343,226	90,013	703,521	113,651	1,666,751	143,464	2,717,400	116.0	—374,174	—383,748	—383,678	—681,727
Texas & New Orleans	July	4,486	1,940,106	189,885	2,423,792	338,140	478,117	106,822	846,306	190,703	1,970,032	81.3	453,760	224,158	26,249	—393,018
	7 mos.	4,520	12,940,510	1,318,254	16,174,425	2,332,775	3,339,955	791,094	5,884,599	1,486,453	13,910,755	86.0	2,263,670	659,616	—680,696	—1,366,932
Spokane, Portland & Seattle	July	552	413,715	45,883	502,180	38,502	42,289	5,482	134,079	15,648	237,654	47.3	264,526	187,856	166,937	33,313
	7 mos.	552	2,026,184	212,650	2,501,589	235,780	312,627	42,209	865,917	122,493	1,585,079	63.4	916,510	378,477	310,538	102,405
Tennessee Central	July	287	152,871	5,551	167,067	26,878	20,606	4,649	55,012	9,276	116,400	69.7	50,667	47,253	32,414	10,439
	7 mos.	291	984,556	25,585	1,070,415	184,666	159,838	34,279	371,020	69,581	819,110	76.5	251,305	231,411	126,338	79,323
Term. R. R. Assn. of St. Louis	July	55	.....	.....	579,035	34,384	37,730	3,216	218,262	14,343	310,183	53.6	268,852	174,505	247,115	82,453
	*7 mos.	55	.....	.....	3,498,339	255,347	195,591	22,050	1,472,363	110,937	2,072,063	59.2	1,426,276	832,300	1,284,248	707,528
Texas & Pacific	July	1,950	1,534,871	145,370	1,857,001	193,827	329,180	63,078	532,993	100,583	1,235,035	66.5	621,966	520,690	374,785	261,842
	7 mos.	1,950	9,357,075	959,198	11,584,200	1,174,825	2,094,429	425,344	3,631,982	727,942	8,154,178	70.4	3,430,022	2,716,492	1,859,177	1,608,903
Texas Mexican	July	162	52,969	732	59,225	8,418	13,271	3,093	22,338	6,666	53,745	90.7	5,480	726	—1,441	—20,563
	7 mos.	162	342,489	4,172	380,262	65,498	89,148	20,323	173,348	47,067	393,481	103.5	—13,219	—45,520	—66,831	3,475
Toledo, Peoria & Western	July	239	186,627	18	189,549	38,552	11,119	13,855	40,049	7,776	111,351	58.7	78,198	67,517	52,845	6,952
	7 mos.	239	922,447	172	936,200	224,063	71,823	96,091	247,927	54,696	694,600	74.2	241,600	208,215	131,858	38,831
Toledo Terminal	July	28	.....	.....	67,364	5,566	5,998	375	23,694	3,755	39,388	58.5	27,976	20,884	36,162	8,289
	7 mos.	28	.....	.....	434,502	30,130	55,446	3,076	189,304	27,870	305,825	70.4	128,677	77,005	167,274	100,143
Union Railroad of Pennsylvania	July	45	.....	.....	496,651	57,758	91,247	114	154,576	12,869	316,564	63.7	180,087	173,281	237,007	—86,760
	7 mos.	45	.....	.....	1,452,759	239,719	612,604	819	627,167	96,265	1,576,574	108.5	—123,815	—170,290	9,999	—459,747
Union Pacific	July	3,767	4,817,995	518,544	5,839,372	478,443	1,080,315	101,969	1,553,797	321,418	3,606,852	61.8	2,232,520	1,580,898	1,357,006	1,174,709
	7 mos.	3,767	26,754,858	2,947,636	32,807,015	2,554,344	6,689,940	745,253	9,966,821	1,915,155	22,252,269	67.8	10,554,746	7,569,343	6,389,575	5,781,901
Oregon Short Line	July	2,504	1,390,320	103,175	1,638,271	211,165	218,709	27,713	529,444	105,794	1,110,004	67.8	528,267	248,590	186,750	—157,537
	7 mos.	2,504	8,721,566	725,725	10,320,291	1,203,849	1,498,334	218,711	3,503,256	636,414	7,228,446	70.0	3,091,845	1,333,319	825,386	332,795
Oregon-Wash. Railroad Nav. Co.	July	2,316	1,068,968	90,737	1,333,757	164,286	149,766	44,585	492,636	96,927	954,724	71.6	379,033	229,015	144,428	—200,872
	7 mos.	2,316	5,599,015	559,959	7,024,002	1,083,576	996,924	328,895	2,986,091	603,059	6,031,057	85.9	992,945	41,531	—636,529	—1,265,665
Los Angeles & Salt Lake	July	1,248	928,223	148,314	1,176,796	148,925	163,466	38,853	344,119	66,299	791,240	67.2	385,556	250,223	138,148	102,866
	7 mos.	1,249	6,146,651	812,756	7,581,890	986,268	1,167,167	297,969	2,382,292	410,011	5,408,358	71.3	2,173,532	1,333,040	514,511	816,645
St. Joseph & Grand Island	July	258	232,438	889	241,583	29,008	23,906	2,546	63,215	14,416	133,322	55.2	108,261	86,789	61,666	—3,291
	7 mos.	258	1,301,623	17,485	1,371,305	163,551	193,369	15,508	418,430	84,710	876,899	63.9	494,406	411,078	265,029	152,242
Utah	July	111	42,779	.....	42,961	8,805	17,596	476	11,652	4,676	43,205	100.6	—244	—6,754	—15,785	—24,862
	7 mos.	111	547,774	.....	550,933	71,308	144,769	3,343	125,185	34,640	379,006	68.8	171,927	115,284	36,570	22,366
Virginian	July	619	1,167,411	7,377	1,208,874	100,537	187,298	15,143	206,913	30,061	538,552	44.5	670,322	530,237	592,640	338,561
	7 mos.	610	7,200,127	34,512	7,527,368	711,206	1,356,850	111,766	1,400,052	205,562	3,781,185	50.2	3,746,183	2,786,085	3,234,786	2,751,093
Wabash	July	2,480	3,070,233	176,297	3,456,969	492,556	489,734	121,744	1,169,912	117,952	2,400,511	69.4	1,056,458	887,014	505,522	—103,096
	7 mos.	2,480	18,004,320	1,082,009	20,554,681	2,728,646	3,397,839	912,637	8,176,326	855,887	16,121,730	78.4	4,432,951	3,143,804	773,188	—624,712
Ann Arbor	July	293	271,772	2,558	288,392	35,369	46,186	9,940	105,115	9,419	206,382	71.6	82,010	69,983	52,927	—28,721
	7 mos.	293	1,562,176	13,140	1,630,514	184,948	305,351	74,450	712,638	66,151	1,344,017	82.4	286,497	181,675	57,436	—34,761
Western Maryland	July	891	1,176,201	15,922	1,226,831	199,687	244,011	30,375	272,098	37,707	789,329	64.3	437,502	367,502	418,144	187,604
	7 mos.	891	6,416,268	51,883	6,668,978	869,032	1,181,021	218,342	1,716,787	252,215	4,257,067	63.8	2,411,911	1,921,911	2,020,683	1,812,279
Western Pacific	July	1,212	848,699	33,648	932,786	182,596	145,838	55,036	311,492	32,753	751,251	80.5	181,535	109,926	93,298	28,720
	7 mos.	1,211	4,963,640	162,485	5,376,033	901,370	1,133,156	385,330	2,149,693	243,836	4,902,141	91.2	473,892	—70,278	—122,962	—517,433
Wheeling & Lake Erie	July	511	1,102,909	1,619	1,183,347	109,972	279,341	25,392	283,994	24,028	722,425	61.1	460,922	342,370	318,484	34,213
	7 mos.	511	5,349,820	10,344	5,672,963	560,387	1,525,279	182,428	1,601,028	176,841	4,045,584	71.3	1,627,379	1,003,729	860,413	—22,665
Wichita Falls & Southern	July	203	53,301	45	56,042	9,533	6,836	1,881	13,544	7,232	39,026	69.64	17,016	14,004	10,731	2,530
	7 mos.	203	301,759	197	314,579	61,310	48,474	11,771	87,449	25,766	234,770	74.63	79,809	60,046	36,855	24,899





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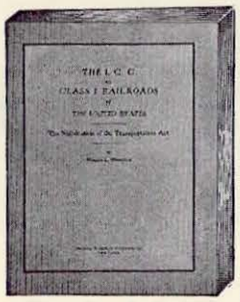

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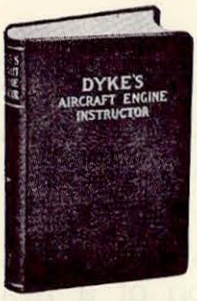

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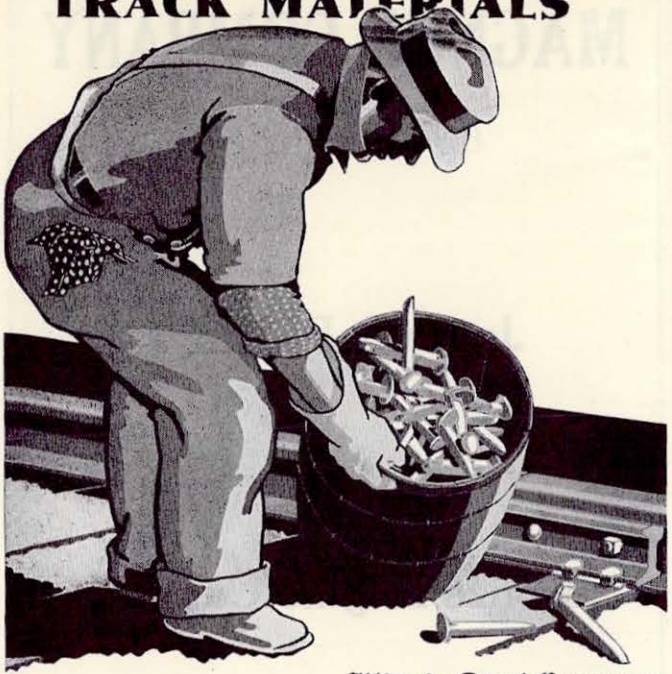

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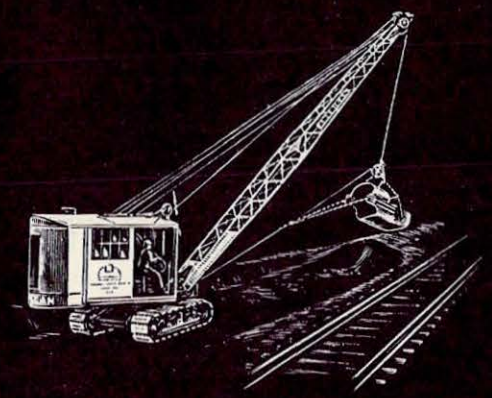

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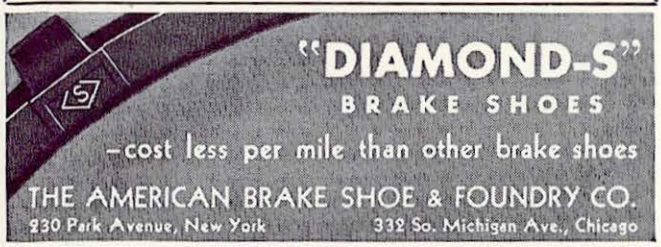

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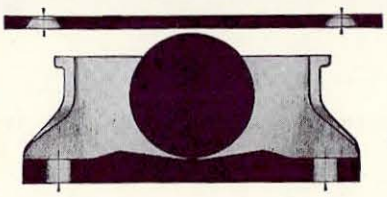

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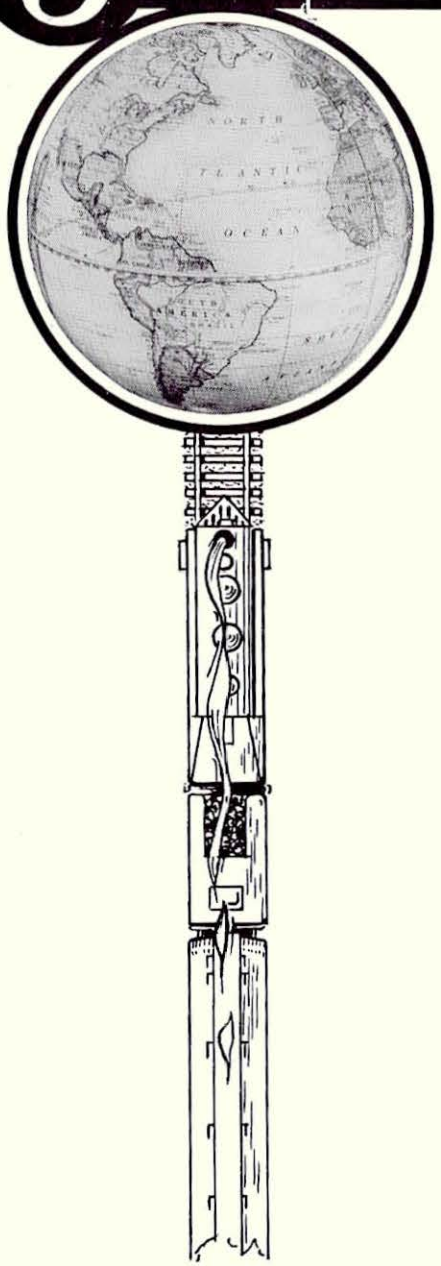

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Annual Return on Investment over and above 6% interest charges	124%	97%

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*Excerpts from Committee Report to the ARA Signal Section, published in ARA SS Proceedings, May, 1933, pp. 135-139

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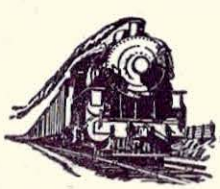
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